



MEMORANDUM

Date: February 8, 2019
To: Noah Rosen, Oakland Athletics
From: Rob Rees and Jordan Brooks, Fehr & Peers
Subject: **Howard Terminal Project AB 734 Analysis**

OK16-0125.05

California Assembly Bill 734 (AB 734) provides that the construction of a new ballpark for the Oakland A's and an accompanying mixed-use development would have a streamlined permitting process under the California Environmental Quality Act (CEQA), with a time-limited appeals process and expedited judicial review. To qualify for this streamlining, the project needs to meet several environmental standards, including a Transportation Management Plan (TMP) and Transportation Demand Management (TDM) Plan (Project 2.0) that combined achieve a 20-percent vehicle trip reduction (VTR) compared to operations absent the TMP and the TDM Plan (Project 1.0). This requirement applies to both the ballpark and the ancillary development components of the project separately, and the 20-percent VTR needs to be achieved within one year after completing the first baseball season for the ballpark component and within one year after completing the ancillary development component. The City of Oakland also requires a 20-percent reduction in vehicle trips as a Condition of Approval (COA) for large development projects.

EXECUTIVE SUMMARY

This memorandum details the calculation of trip generation estimates under Project 1.0 and Project 2.0 for the project's ballpark and ancillary development components at Howard Terminal. In addition, the memorandum provides a menu of potential TMP and TDM strategies with estimated VTR derived from each strategy where applicable. Proposed monitoring and evaluation methods verifying the effectiveness of the TMP and the TDM measures are also included.

Howard Terminal would be developed to include a 35,000-attendee capacity ballpark, as well as ancillary development that includes a 3,500-seat performance theater, 3,000 residential units, 1.5 million square feet of office space, a 400-room hotel, and 270,000 square feet of commercial space.



The ballpark would host 81 regular season baseball games, one to two pre-season games, and up to 11 post-season games. Three to 15 concerts would occur each year, and there would be about 35 other small events, 100 corporate / community events, and up to 16 events at the plaza adjacent to the ballpark. The 3,500-seat performance theater would host roughly 50 events each year.

For the ballpark component of the project, a travel mode choice model was constructed to estimate trip generation for Project 1.0 and Project 2.0. Project 1.0 considers a ballpark at Howard Terminal operated in the same way that the A's operate at the Coliseum without any consideration for managing vehicle generation, maintaining today's personal vehicle parking availability, and no special accommodations for or attempt to encourage non-automobile transportation. Project 2.0 considers implementation of a TMP and TDM strategies to achieve a 20-percent VTR.

Compared to the Coliseum, a ballpark at Howard Terminal would induce three primary changes in the travel patterns of attendees, each of which were addressed in the model.

- Attendees who currently take BART to the Coliseum from origins in and around downtown Oakland will shift modes to access a ballpark at Howard Terminal.
- Attendees who currently drive to the Coliseum from origins near Howard Terminal will shift modes to access a ballpark at Howard Terminal.
- Attendees from south or southeast of the Coliseum site, for whom the Howard Terminal site represents a longer travel distance, may no longer attend games, replaced by those for whom games would be more conveniently located.

A wide variety of TMP measures were considered and studied as part of a program to achieve VTR goals for the ballpark at Howard Terminal. A menu of the potential options studied in this memorandum to reduce vehicle trips is provided in **Table ES-1**.

The A's through the City of Oakland Standard Conditions of Approval will be required to incorporate enough TMP measures to ensure the ballpark VTR is 20%. Several of the TMP measures from Table ES-1 were assumed to comprise Project 2.0 for the purposes of this memorandum to illustrate how the A's might achieve the 20-percent vehicle trip reduction, although these measures may not represent the final list of implemented measures. **Table ES-2** presents the trip generation and VTR estimates for a ballpark Project 2.0 consisting of the following TMP measures:

- Reduce the number of on-site ballpark parking spaces from 6,800 to 3,500.
- At nearby on-street parking spaces, introduce game time parking restrictions that prevent use by ballpark attendees.



TABLE ES-1: DESCRIPTION OF BALLPARK TMP MEASURES AND VTR ESTIMATE

TMP Measure	Description	VTR Estimate
Reduced On-Site Parking Spaces	Reduce the number of on-site parking spaces available for ballpark attendees to 3,500	5-9%
On-Street Parking Management	At nearby on-street parking spaces introduce gameday time restrictions that prevent use by ballpark attendees	2-3%
BART Shuttles	Gameday shuttles between 12th Street BART station and the ballpark	1-3%
	Additional gameday shuttles between West Oakland and Lake Merritt BART stations and the ballpark	1%
Gondola	Gondola service between 12th Street and the ballpark	4-7%
Special Event Ferries and Water Taxis	Gameday and special event ferry (one ferry) to Oakland Jack London Square ferry terminal from either Alameda, Richmond or Vallejo	1%
Improved AC Transit Service	Move bus stops to provide high-frequency AC Transit service adjacent to the ballpark	1%
Transit Reimbursement	Price of transit trip is included in the ticket price, redeemed upon scanning Clipper card inside ballpark gates	1-2%
Carpool Preference	Reserve the closest 30% of on-site parking spaces for vehicles with 4+ occupants	1-3%
TNC Surcharge and Geofence	Before and after ballpark games and events, TNC users pay a surcharge to pick-up/drop-off on-site or at the designated pick-up/drop-off zone. All other TNCs geofenced for 0.5 miles from the ballpark in all directions. Enforcement would occur through the use of traffic control officers.	9-14%
Develop Howard Terminal	Develop Howard Terminal with high-density housing and office uses	<1%
Bicycle Valet Parking	Provide a free bicycle valet parking service for at least 500 bicycles	2%

Source: Fehr & Peers, 2019.

TABLE ES-2: BALLPARK VEHICLE TRIP GENERATION AND VTR

Scenario	Weekday Evening ¹	Weekday Day ¹	Weekend ¹	Concert ^{2, 3}	Weighted Average ⁴
Project 1.0	27,400	27,800	28,600	22,800	27,400
Project 2.0	22,200	20,800	22,900	19,600	21,900
VTR	19%	25%	20%	14%	20%

Notes:

1. Includes 35,000 attendees and 1,320 employees
2. Includes 28,000 attendees and 1,200 employees
3. The concert venue trip generation can be adjusted based on attendance and staff to represent the other smaller events, corporate / community events, and plaza events anticipated to be held at the ballpark.
4. The weighted average calculated based on 41 weekday evening games, 14 weekday day games, 27 weekend games, 9 concerts.

Source: Fehr & Peers, 2019.



- Construct a geofence of 0.5 miles from the ballpark in all directions before and after baseball games and large events for transportation network company (TNC) vehicles, with a surcharge rationing access to the pick-up/drop-off zones on-site and nearby off-site. Enforcement would occur through use of traffic control officers.
- Develop Howard Terminal with high-density residential and office uses.
- Provide free bicycle parking with security oversight and the ability to serve 500 bicycles.

The ancillary development must also achieve a 20-percent reduction in vehicle trips to receive the benefits conferred by AB 734, and the City of Oakland requires a 20-percent reduction in vehicle trips as a COA for large development projects. Travel patterns for the ancillary development are expected to be similar to other land uses with similar locations and characteristics, so Project 1.0 trip generation was calculated using standard methodologies. Project 2.0 includes parking reductions and operational strategies as well as TDM elements from the City of Oakland's COA. Many of the TDM elements from the COA are difficult to model, so trip generation calculations focused primarily on parking reductions as a means to affect the number of vehicle trips. **Table ES-3** presents the trip generation and VTR estimates for ancillary development Project 2.0 with the following elements:

- Adhere to parking maximums of:
 - 1.0 parking spaces per residential unit
 - 2.0 parking spaces per 1,000 square feet office
 - 2.6 parking spaces per 1,000 square feet retail / restaurant
 - 0.5 parking spaces per hotel room
 - parking spaces for the performance venue would be shared with the ballpark
- Construct physical improvements, such as corridor-level bikeway and pedestrian improvements, that help facilitate travel by modes other than automobiles.
- Execute on-going operational strategies, such as unbundled parking and designated carshare spaces, to reduce automobile ownership and encourage non-automobile travel.

The results presented in Table ES-3 illustrate VTR reductions on days without and with the performance venue since the venue will only be active about 50 days each year. Further VTR reductions would be achieved on days with a baseball game when about one half of the hotel would cater to the visiting ball team and related activities. On these days, an additional 1 to 2% VTR could be achieved.

Over the course of one year the weighted average VTR for the ancillary development is 21% assuming the performance venue has 50 weekend performances and the hotel caters to the visiting baseball teams.



TABLE ES-3
VTR ESTIMATES FOR HOWARD TERMINAL ANCILLARY DEVELOPMENT

Land Use	Weekday			Weekend		
	Project 1.0	Project 2.0	VTR	Project 1.0	Project 2.0	VTR
Residential	8,900	6,300	-30%	8,000	5,700	-30%
Office	10,900	7,800	-28%	1,600	1,100	-28%
Retail	6,600	5,500	-17%	6,800	5,600	-18%
Restaurant	7,500	6,200	-17%	8,500	7,000	-18%
Hotel	3,000	3,000	-0%	2,300	2,300	-0%
Performance Venue	3,000	3,000	-0%	3,000	3,000	-0%
Total with Venue	39,900	31,800	-20%	30,200	24,700	-18%
Total Without Venue	36,900	28,800	-22%	27,200	21,700	-20%

Source: Fehr & Peers, 2019.

The rest of this memorandum details the methodology and results of the trip generation estimates presented in Table ES-1, Table ES-2 and Table ES-3. It also describes in detail a menu of available measures (including those not considered part of Project 2.0) for both the ballpark and ancillary development, with individual VTR estimates available for ballpark measures. A discussion of monitoring, evaluation, and enforcement is also provided.

1 BALLPARK

The Howard Terminal Ballpark would be constructed on the eastern portion of the Howard Terminal site and have a 35,000-person capacity. Absent a TMP, the ballpark would also include 6,800 parking spaces with at-grade vehicle access at Market Street and at Martin Luther King Jr Way. Howard Terminal is currently used to support Port of Oakland operations with truck parking, container storage, and longshoreman training and administration. These existing uses would likely relocate to other Port properties, and the associated vehicle trips would remain on the network, albeit at somewhat different locations.

Three types of gameday scenarios were studied: weekday evening games, which typically start around 7:00 PM; weekday day games, which typically start around 12:30 PM; and weekend games,



which typically start at either 1:00 PM or 6:00 PM. Around half of A's home games are weekday evening games, about one-sixth are weekday day games, and about one-third are weekend games.

The ballpark is anticipated to occasionally host large special events, such as concerts, providing at most 28,000 people for these events. These events would be similar to the larger events that now occur at the Oracle Arena. Like the baseball games, vehicle trips for these events were estimated under Project 1.0 and then under Project 2.0 with a set of TMP strategies to assess VTR.

1.1 DATA SOURCES

A variety of data describing the existing travel behavior of attendees to A's games at the Coliseum and attendees to the larger popular events at Oracle Arena was collected to help develop Howard Terminal Ballpark trip generation estimates. A brief description of the data, the data provider, and what the data was used for is presented in **Table 1** on the following page.

1.2 BASEBALL GAME PROJECT 1.0 TRIP GENERATION

Trip generation calculations are based on at-capacity attendance at the ballpark. Games at capacity represent the highest impacts of the ballpark on the transportation system, and it is therefore essential to ensure that the TMP strategies reduce vehicle trips to a satisfactory extent under these conditions. To the extent that actual attendance is typically below capacity, trip generation would be less than is calculated here.

Project 1.0 conditions for Howard Terminal represents the operations without any consideration for managing vehicle generation. 6,800 parking spaces would be provided¹ to maintain today's personal vehicle parking availability on Howard Terminal, and no special accommodations for or attempt to encourage non-automobile transportation would be undertaken. Both Market Street and Martin Luther King Jr Way would remain as four-lane streets to maximize vehicle throughput to and from Howard Terminal. Existing sidewalks on these streets would remain with no enhancements. On-site and off-site pick-up/drop-off and waiting zones for transportation network companies (TNCs) like Lyft and Uber are considered part of the Project 1.0 conditions but without operational strategies to maximize efficiency and minimize vehicle congestion.

¹ The Coliseum provides around 9,100 spaces for a 47,000-seat baseball capacity. 6,800 spaces at the Howard Terminal Ballpark maintains the same ratio of parking spaces-to-seat capacity.



TABLE 1
SUMMARY OF DATA SOURCES USED FOR BALLPARK TRIP GENERATION

Data	Data Provider	Use
BART Hourly Origin-Destination Volumes ¹	BART	-Existing Gameday/Event BART Mode Share -Geographic Distribution of BART Rider Attendees
Coliseum Turnstile Attendance ²	Oakland A's	-Existing Gameday Mode Share at Coliseum
Oracle Arena Concert Attendance ³	Billboard	-Existing BART Mode Share for High-Demand Concerts at Oracle Arena
Vehicle Origin-Destination Distribution ⁴	StreetLight Data	-Geographic Distribution of Vehicle Attendees -Driver Second-Choice Mode Preferences
Driveway Counts ⁵	IDAX	-Gameday/Event TNC Mode Share
Vehicle Occupancy ⁶	Fehr & Peers	-Gameday/Event Average Vehicle Occupancy
Downtown Oakland Parking Supply and Occupancy ⁷	City of Oakland	-Parking Spaces Available for Ballpark Attendees

Notes:

1. BART hourly origin-destination volumes can be found at <http://64.111.127.166/origin-destination/>. Data collected for A's games during the 2017 season.
2. Per-game data collected for A's games during 2017 season.
3. Six large weekend evening concerts at Oracle Arena in 2017 were studied, using data from Billboard Boxscore:
 - Red Hot Chili Peppers (3/12)
 - Panic! At the Disco (3/25)
 - Roger Waters (6/10)
 - Arcade Fire (10/21)
 - Enrique Iglesias and Pitbull (10/28)
 - Jay-Z (12/16)
4. Based on cell phone location-based services data collected for A's games played between July 2016 and September 2017. More information on the data source can be found at <https://www.streetlightdata.com/>.
5. Driveway counts of entering and exiting vehicles were collected at the main gate and gates with significant traffic on one game day for each type (weekday evening, weekday day, and weekend) during September 2018. Counts were collected from two hours prior to the game's start time to two hours after the final out.
6. Field observations of vehicle occupancy were collected at the main gate for a weekend game in September 2018. Counts were collected from two hours prior to the game's start time to 30 minutes after the start time.
7. Parking supply data included on-street and publicly-available off-street spaces. Occupancy data included availability on each block and lot/garage at 1:00 PM and 7:00 PM on weekdays and Saturday at 1:00 PM. Supply and occupancy data were collected in 2015. Parking supply was adjusted to reflect parking lots developed since 2015, but demand at the lots were maintained.

Source: Fehr & Peers, 2019.



Instead of making assumptions about global changes to mode split, the trip generation analysis in this memorandum models the impact of moving to Howard Terminal by assessing the mode choice impact on specific geographies to build a global mode shift estimate.

1.2.1 EXISTING GAMEDAY TRAVEL BEHAVIOR AT THE COLISEUM

Calculation of Project 1.0 trip generation for the Howard Terminal Ballpark begins with the mode split of attendees to the existing Coliseum. **Table 2** presents the estimated mode of access for attendees to the Coliseum ballpark for each of the three game types.

TABLE 2
EXISTING COLISEUM BALLPARK MODE OF ACCESS

Mode	Weekday Evening	Weekday Day	Weekend
Drive	70%	71%	74%
TNC ¹	7%	7%	7%
BART	23%	22%	19%
Walk/Bike/Other Transit ²	*	*	*

Notes:

1. Assumes TNCs were 9% of total vehicle use, based on driveway count data.
2. Negligible use of other modes observed during field visits

Source: Fehr & Peers, BART, 2019.

For home games during the 2017 season, BART hourly ridership data by origin-destination pairs was used to calculate the average number of exits at the Coliseum BART station on each of the three gameday types three hours before the scheduled start time to one hour after the scheduled start time. The average volume of Coliseum exits during those times on days without a game was then subtracted to estimate BART riders traveling to the Coliseum for the A's game. Days on which other events occurred at either the Coliseum or Oracle Arena were excluded from the analysis. Variable game end times make it difficult to accurately describe departure mode split using historical data, so the departure mode split is assumed to be similar to the arrival mode split.

These BART ridership numbers were compared against the average turnstile attendance in the 2017 season for each of the game types to calculate the BART mode share. All other attendees were assumed to travel to games at the Coliseum by automobile. Land use intensity near the Coliseum is low, bus service is limited, and field observations found a negligible number of attendees arriving to the main entrance on foot or by bus. While attendees arriving via other modes may also access



the Coliseum through the BART station pedestrian bridge, this is unlikely to describe a significant number of attendees.

The share of attendees arriving by TNC was estimated by using driveway counts from one game of each game type in September 2018. Vehicles exiting the Coliseum between two hours prior and one hour after game start were assumed to be TNCs, and that number was compared to the total number of vehicles entering the site during that time. The exiting percentage across the three game types was averaged due to the small sample size, and the average TNC rate of 9% of all entering vehicles was established and assumed to apply to all three game types.

Moving to a ballpark at Howard Terminal would induce three overarching changes in travel patterns of attendees that must be addressed to model Project 1.0 trip generation. These changes are discussed in the next sections and include:

- Attendees who currently take BART to the Coliseum from origins in and around downtown Oakland will shift modes to access a ballpark at Howard Terminal.
- Attendees who currently drive to the Coliseum from origins near Howard Terminal will shift modes to access a ballpark at Howard Terminal.
- Attendees from south or southeast of the Coliseum site, for whom the Howard Terminal site represents a longer travel distance, may no longer attend games, replaced by those for whom games would be more conveniently located.

Tables with data regarding existing distributions and assumptions of mode splits and geographic shifts for arrivals and departures for each game type can be found in **Appendix A**.

1.2.2 MODE SHIFT OF CURRENT BART RIDERS

Some attendees who currently take BART to the Coliseum would switch modes to attend games at Howard Terminal. Depending on the origin station, varying proportions of attendees were assumed to switch to TNCs, walking, bicycling,¹ buses, or ferries. Attendees who currently use BART to attend games were assumed to continue to be non-drivers, and therefore none were assumed to switch to driving a personal vehicle.

Attendees who take BART from the three Downtown Oakland BART stations or the West Oakland BART station to games at the Coliseum would not utilize BART if games were played at Howard Terminal. West Oakland, 12th Street Oakland City Center, and Lake Merritt stations are the three closest stations to Howard Terminal and are roughly equidistant. The 19th Street Oakland station

¹ Bicycling includes shared micro-mobility options like docked and dockless bike share and e-scooters.



is also close to Howard Terminal, and attendees would not ride BART to travel from 19th Street to 12th Street. In Project 1.0 without a TMP strategy, riders from these closest stations would mostly either walk to the ballpark or take a TNC, with a small percentage bicycling or taking the Broadway Shuttle (for weekday games only, as the Broadway Shuttle does not operate on weekends).

Some riders who currently take BART to the Coliseum from the MacArthur, Ashby, Rockridge, or Fruitvale BART stations may switch modes to TNCs, as the closer location makes these rides more economical, and the ability to use local roads and the greater distance of the ballpark from BART stations makes TNC rides more time competitive. Lastly, some attendees who currently take BART from the San Francisco stations of Embarcadero and Montgomery may switch to ferries for the game types and times when convenient ferry service is provided. Under Project 1.0 conditions, this is primarily arrivals for weekday evening games and departures from weekend games, as ferry service for other time periods is either not provided or not well-timed to game attendance needs.

1.2.3 MODE SHIFT OF CURRENT DRIVERS

Some attendees who currently drive to the Coliseum from areas near Howard Terminal were also assumed to switch modes to attend games at Howard Terminal. Most attendees within one mile of the Howard Terminal Ballpark were assumed to switch to walking, with some taking TNCs, and a small percentage bicycling, taking a bus, or continuing to drive themselves. At one to two miles from Howard Terminal, most current drivers were assumed to switch to TNCs, with a substantial minority continuing to drive themselves and a smaller percentage bicycling or taking a bus to the new ballpark. For current drivers between two and five miles from the Howard Terminal site, the majority were assumed to remain drivers to a ballpark at Howard Terminal, with almost all of those who switched modes using TNCs.

In addition to attendees close to Howard Terminal, some who drove to the Coliseum from locations less than about 1.5 miles away from the Coliseum were also assumed to change modes, as driving from those locations becomes much more onerous with a move to Howard Terminal. Half of these drivers were assumed to continue to drive, with most others shifting to BART or TNCs.

1.2.4 GEOGRAPHIC SHIFT OF ATTENDEES

Moving to a new ballpark at Howard Terminal would not only cause mode shift for some current attendees, but also result in a new geographic distribution of attendees. Fewer attendees would hail from areas south or southeast of the Coliseum, as travel distances and travel times would increase for those fans.



BART riders from south of the Coliseum station would have their travel times increased by at least 30 minutes to get to the Howard Terminal Ballpark compared to the Coliseum. Additionally, all riders at stations from Castro Valley and beyond along the Dublin/Pleasanton line, and some riders at stations from Hayward and beyond along the Warm Springs/South Fremont line, would either change trains at Lake Merritt to get to 12th Street, continue to the West Oakland station, or walk the additional distance from the Lake Merritt station to the ballpark. Because of these factors, ridership from stations south or southeast of Bay Fair was reduced.

Drivers from south of the Coliseum would also see their travel times increased with the move to Howard Terminal. Although Howard Terminal is only about six miles north of the Coliseum, that travel would be during peak commuting hours for arrivals to weekday evening games and departures from weekday day games. As such, the number of drivers from locations more than 20 miles south or southeast of Howard Terminal was assumed to be reduced. Traffic on weekends is less peaked, but the longer travel distances would still discourage some people from those locations from attending.

Geographic locations with gains in attendance, by contrast, would be concentrated in close-in areas in Oakland and Alameda, as well as other areas where Howard Terminal represents a more convenient trip, like San Francisco and central Contra Costa County. The distribution of these attendance gains was taken from an analysis performed by the A's. The mode split of attendees from these locations varied depending on availability and ease of transportation options.

1.2.5 ESTIMATED PROJECT 1.0 MODE SPLIT AND TOTAL VEHICLE TRIPS

From the calculations described above, the mode split of attendees under Project 1.0 was estimated. Because the total number of personal vehicles arriving needs to equal the total number of vehicles departing, the maximum drive mode share between arrivals and departures was used for each game type. All other modes were then adjusted based on their relative proportions.

From the mode splits, total vehicle trips were calculated by assigning two trips total to each personal vehicle—one trip on arrival and one on departure—as well as two trips for each arriving TNC and two trips for each departing TNC to account for the fact that each TNC trip must both enter and exit the area. Employee trips were also considered, using an assumption of 1,320 employees with a 15-percent drive mode share. The mode split for attendee arrivals and departures for each game type is presented in **Table 3**, in addition to the total vehicle trips (including employee trips).



TABLE 3
PROJECT 1.0 HOWARD TERMINAL BALLPARK MODE SPLIT AND TRIP GENERATION

Mode	Weekday Evening		Weekday Day		Weekend	
	Arrivals	Departure	Arrivals	Departures	Arrivals	Departure
Drive	57%	57%	56%	56%	62%	62%
TNC	18%	18%	19%	19%	18%	18%
Walk	3%	2%	3%	3%	2%	2%
Bicycle	<1%	<1%	<1%	<1%	<1%	<1%
Ferry	1%	<1%	<1%	<1%	<1%	<1%
Bus	1%	1%	1%	1%	1%	1%
BART	20%	22%	21%	20%	18%	17%
Total Vehicle Trips	27,400		27,800		28,600	

Source: Fehr & Peers, 2019.

1.3 SPECIAL EVENT PROJECT 1.0 TRIP GENERATION

Special events, typically concerts, held at the Howard Terminal Ballpark are anticipated to have a maximum 28,000 attendees, and a similar process as described above for baseball games was performed to calculate trip generation estimates for these special events. Existing mode of access was calculated using BART data for high-demand concerts at Oracle Arena in 2017, and the proportion of TNCs to private vehicles was assumed to be like what was observed at baseball games. **Table 4** summarizes estimated mode of access for existing special events at Oracle Arena.

Geographic distribution of attendees to the concerts differed from the baseball games, with a much higher percentage of concert attendees arriving from San Francisco BART stations and driving from San Francisco and the Oakland core and a much lower percentage of concert attendees using BART or driving from the Castro Valley and Dublin/Pleasanton areas. Using the existing distributions for these events, the same mode shift and geographic shift calculations were performed as described in the previous section. These events were assumed to have 1,200 employees, with the same 15-percent drive mode share as for baseball games. The estimated Project 1.0 attendee mode split and trip generation (including employee trips) of these special events is presented in **Table 5**.



TABLE 4
EXISTING ORACLE ARENA SPECIAL EVENT MODE OF ACCESS

Access Mode	Mode Share ¹
Drive	73%
TNC ¹	7%
BART	20%
Walk/Bike/Other Transit ²	*

Notes:

- Based on BART and Billboard data for the following high-demand concerts at Oracle Arena in 2017:
 - Red Hot Chili Peppers (3/12)
 - Panic! At the Disco (3/25)
 - Roger Waters (6/10)
 - Arcade Fire (10/21)
 - Enrique Iglesias and Pitbull (10/28)
 - Jay-Z (12/16)
- Assumes TNCs were 9% of total vehicle use.
- Negligible use of other modes assumed.

Source: Fehr & Peers, BART, 2019.

TABLE 5
PROJECT 1.0 HOWARD TERMINAL SPECIAL EVENT MODE SPLIT

Access Mode	Mode Share
Drive	57%
TNC	20%
Walk	4%
Bicycle	<1%
Ferry	<1%
Bus	1%
BART	18%
Total Vehicle Trips	22,800

Source: Fehr & Peers, 2019.



1.4 POTENTIAL TMP MEASURES FOR BALLPARK

This section presents the menu of options (or measures) that might be utilized in the TMP for the Howard Terminal Ballpark. Each measure would affect total vehicle trips at the ballpark differently for different game types and special events, depending on the mode share. Additionally, measures become increasingly effective when paired with other complementary measures, so aggregate effects are typically greater than effects in isolation. The measures presented in this memorandum are not meant to be requirements. Rather, they offer a menu of options available to the A's to achieve an end goal of at least 20 percent VTR.

1.4.1 SUMMARY OF TMP MEASURES

This analysis only considers TMP measures that were quantifiable using the approach described previously. This does not imply that other measures not in this analysis do not have an impact on vehicle trips. Rather, those measures either may be difficult to model accurately under the framework used in this analysis or would be inappropriate to isolate in the absence of a wholistic transportation management strategy. The menu of analyzed measures follows five general strategies, as described in **Table 6** and listed below:

- Parking Reductions
- Downtown Connections
- Better Transit Options
- Reduced Vehicle / Trip Demand
- More Walking and Biking

Effectiveness of a suite of measures for each game type is assessed using the trip generation tool prepared for this memorandum. A description of the measures and how they affect the assumptions of Project 1.0 regarding mode share and geographic distribution are below. The specific changes each measure makes to the Project 1.0 assumptions are presented in **Appendix B**.

1.4.1.1 Parking Reductions

The new ballpark would provide 6,800 parking spaces under Project 1.0, and drivers were assumed to be willing to walk about 20 minutes (or one mile) from a parking space to the ballpark. Within that radius, there are about 4,600 available off-site spaces for weekday evening games and 2,700 available spaces for weekday day games. Weekend games were assumed to have the same number of available off-site parking spaces as weekday evening games. Under Project 1.0, there would be enough on- and off-site spaces to accommodate all attendees who would prefer to drive.



TABLE 6
TMP MEASURES BY STRATEGY FOR BALLPARK VEHICLE TRIP REDUCTION

Strategy	Measures	Impacts
Parking Reductions	On-Street Parking Management	Reduces parking spaces available for attendees. Shifts attendee travel modes mostly towards BART (which reduces vehicle trips) and TNCs (which increase vehicle trips).
	Reduce On-Site Parking Spaces	
Downtown Connections	BART Shuttles	Reduces TNC/driving mode share by providing an alternative to walking, improving the convenience and attractiveness of taking BART.
	Gondola	
Better Transit Options	Special Event Ferries and Water Taxis	Shifts attendees towards transit by introducing new transit services or making existing services more attractive.
	Improved AC Transit Service	
	Transit Reimbursement	
Reduced Vehicle/Trip Demand	Carpool Preference	Decreases the number of vehicles and trips demanded to serve the ballpark by reducing the attractiveness of high-trip TNCs and increasing private vehicle efficiency.
	TNC Surcharge and Geofence	
More Walking and Bicycling	Develop Howard Terminal	Increases the number of people who may use active modes to access the ballpark.
	Valet Bicycle Parking	

Source: Fehr & Peers, 2019.

Measures that reduce the available parking to attendees reduces the number of vehicle trips by physically constraining the number of attendee vehicles that can be parked within a reasonable distance of the ballpark. To model this effect, attendees who would prefer to drive and park in excess of the number of available on- and off-site spaces were assigned instead to their second-choice mode. Attendees with the greatest likelihood to shift to a second-choice mode due to limited parking availability are those driving from relatively nearby and drivers with an origin near a BART station. Drivers greater than five miles away and not proximate to a BART station would be less likely to switch modes if parking supply were constrained.

To assess the relative sizes of these groups, the number of drivers between two and five miles of Howard Terminal was compared to the number of drivers within about two miles of BART stations outside of the Oakland core. After factoring in previous mode and geographic shifts, about 70% of the pool of drivers with convenient second options were those near BART stations. Therefore, 70% of attendees who were no longer able to drive to the ballpark were assumed to switch to BART, with most of the others switching to TNCs.



Reduced On-Site Parking Spaces

Under Project 1.0, Howard Terminal provides 6,800 parking spaces for ballpark attendees to use. This measure would restrict the number of available parking spaces to 3,500. The primary impact of this measure would be to increase the number of displaced vehicles, thereby shifting those attendees' modes mostly towards BART and TNCs.

This measure has the largest VTR impact of any of the identified strategies, as it directly and dramatically reduces the number of attendees who drive to the game. The trip reduction effect of this strategy, however, is tied to the mode choice of those displaced drivers, since attendees who switch from driving to TNCs double their number of vehicle trips. Therefore, this strategy is most effective when paired with other strategies that reduce the appeal of TNC use.

On-Street Parking Management

Under Project 1.0, on-street parking restrictions continue to operate as they currently do, with a mix of free parking, paid parking, and two- or four-hour time restrictions, all of which end at 6:00 PM. Within one mile of Howard Terminal, there are roughly 500 on-street parking spaces available during weekday day games and 900 available at other times. This TMP measure eliminates the ability of ballpark attendees to use these on-street parking spaces, including by potentially implementing and extending time restrictions past their current 6:00 PM cut-off.

By reducing the effective parking supply, some attendees who otherwise would have driven would switch to other modes. The effectiveness of this measure depends on the overall supply of parking being a binding constraint. This measure will have little effect if parking supply is more than parking demand, and it therefore should be paired with other measures that reduce the parking supply to get the most VTR.

1.4.1.2 Downtown Connections

Under Project 1.0, attendees who use BART to travel to or from the ballpark must walk about 20 minutes between BART stations and Howard Terminal. This dramatically decreases the time competitiveness of BART compared to vehicles, particularly considering that travel time spent walking is generally viewed as less preferable than travel time spent on other modes. Likewise, workers and residents in Downtown and Uptown Oakland face potentially longer walks to the ballpark if they originate north of 12th Street, and the use of TNCs for these attendees to access the ballpark in the absence of alternative options is likely. Better connections between Downtown Oakland and the ballpark would reduce vehicle trips by increasing the attractiveness and convenience of BART and providing a reasonable alternative for downtown workers and residents.



BART Shuttles

This measure introduces a shuttle system between the 12th Street Oakland City Center BART station and Howard Terminal. The measure could be expanded to include shuttle service between West Oakland BART and Howard Terminal, as well as Lake Merritt BART and Howard Terminal. Shuttle service would not only increase BART ridership by increasing convenience, but also increase walking mode share, as attendees within walking distance of the shuttle stops could walk to the shuttle to take it to Howard Terminal. The shuttle service would determine optimal routing and service requirements based on attendee preferences (as captured by surveys) in coordination with the City of Oakland and service provider.

This measure primarily reduces vehicle trips by encouraging more attendees within a moderate distance of Downtown Oakland to use BART or walk instead of switching to TNCs. The West Oakland and Lake Merritt shuttles have a smaller effect as the 12th Street shuttle because BART riders who wanted to use the shuttles already would have been able to do so at 12th Street.

VTR impact of BART shuttles is moderate and relatively unaffected by the implementation of other measures. The impact is moderate because while these shuttles encourage mode shift primarily away from TNCs (which have the largest vehicle trip impact), they have a capacity of only about 2,200 riders per hour, much less than the peak-hour attendee BART ridership. This means that they would likely not serve all BART riders and downtown workers and residents who would want to use them. Additionally, shuttles would not be able to drop off on-site, meaning that overall travel times would only be reduced by up to 5 minutes, though riders would still not have to walk.

BART shuttles have relatively limited synergies with other measures because shuttles do not cause much of a mode shift for attendees who currently drive from outside of Oakland. Even with shuttles, the location of Howard Terminal is still less convenient to BART than is the Coliseum site. If an attendee currently drives to the Coliseum, they are likely to continue to drive to Howard Terminal.

Gondola

As an alternative to a shuttle between the 12th Street Oakland City Center BART station and the ballpark at Howard Terminal, a gondola could be provided that would transfer attendees between the two locations. The gondola's capacity of 6,000 riders per hour would serve most or all attendees using BART, even during the peak post-game hour. The gondola would also provide a faster travel time than the shuttle reducing overall travel time by up to 10 minutes compared to walking.



The impact of the gondola would have a similar effect as the BART shuttles on what kinds of attendee behavior would be affected, but the size of the effect would be larger due to its greater capacity and convenience.

1.4.1.3 Other Transit Options

Improving transit options, either by introducing new services specially tailored to ballpark events, optimizing existing services, or reducing the cost of transit can have a moderate impact on vehicle trips by inducing some attendees to forgo driving.

Ballpark Gameday/Event Ferries and Water Taxis

Under Project 1.0, ferry service at the Oakland Jack London Square ferry terminal is poorly timed to accommodate game attendees, except for those who want to arrive via ferry for weekday evening games and then use a different mode when departing. However, as the San Francisco Giants do for their home games, it is possible to organize special gameday ferries with WETA, the Golden Gate Ferry, or a private operator. Howard Terminal's location on the waterfront lends itself to these ferries because of the short distance between the ferry terminal and the ballpark.

This measure would consider special event ferry service to Oakland from San Francisco, Richmond, Vallejo, or elsewhere. Water taxis between Oakland and Alameda are also potential options depending on ballpark attendee preferences, as determined through surveys. These services would operate similarly to the San Francisco Giants service, arriving about 20 minutes before the start of the game or event and departing about 20 minutes after the final out or end of the event. Because of the proximity of the Oakland and Alameda ferry terminals, water taxi service could have multiple runs before and after a game or special event. This measure would induce more attendees from the Alameda, San Francisco, Richmond, and Vallejo areas to use the ferry.

The total increase in ferry ridership was calibrated to model one San Francisco-Oakland ferry, one Richmond-Oakland ferry, and water taxi service equivalent to one ferry between Oakland and Alameda. An increase in ferry ridership from San Francisco would not affect the number of vehicle trips (riders within walking distance of the Ferry Building would otherwise use BART), but riders from Alameda, Richmond and Vallejo areas switching from vehicles to the ferry would result in a reduction in vehicle trips.

Improved AC Transit Service

Under Project 1.0, AC Transit serves the Howard Terminal site, with only Line 72/72M/72R offering high-frequency service with stops within a quarter-mile of the site. Except for the Broadway Shuttle



on weekdays which is about one-third of a mile from the site, other routes with high-frequency service require a 20- to 25-minute walk to the ballpark.

This measure improves AC Transit service to the project site by bringing the Line 72/72M/72R bus stop to Jefferson Street at 2nd Street, one block from the Martin Luther King Jr Way corridor pedestrian access to the ballpark. This measure would moderately increase bus ridership to the games, with the size of the effect assumed to be an increase of about two to three full busloads of attendees. Overall, the size of the effect was small because of the limited number of attendees who use, or might plausibly switch to, bus service to travel to and from the ballpark.

Transit Reimbursement

Transit use could be incentivized by including a transit trip reimbursement in the ticket price. Attendees who use a Clipper card to access the ballpark would “tap in” as they enter the ballpark, with their account credited for the cost of transit taken within a certain time period of their entrance. This reimbursement would only apply to transit taken to access the ballpark, as it would not be possible to monitor whether attendees used transit to depart as well. This measure would reduce the cost of transit and therefore improve its attractiveness in relation to driving or using TNCs.

1.4.1.4 Reduced Vehicle/Trip Demand

Another way measures approach VTR reductions is to reduce the demand for vehicle trips. This can happen either by reducing the number of vehicles (and therefore trips) used to serve a given number of people by increasing occupancies, or by discouraging vehicle trips through making the use of automobiles a less convenient option for attendees.

Carpool Preference

Under Project 1.0, all vehicles are given equal priority to park at Howard Terminal, regardless of vehicle occupancy. Field observations of entering vehicles indicate that around 20% of vehicles arriving to the Coliseum on gamedays contain four or more occupants, with an overall average of 2.41 attendees per vehicle.¹ If the most convenient spaces were reserved for carpools with four or more occupants, attendees would increase the number of people they transport in each vehicle, resulting in an increased average vehicle occupancy. If 30 percent of the parking spaces on Howard

¹ Vehicle occupancy data was taken at the main gate of the Coliseum during the two hours prior and half-hour following the start of the A’s home game on September 8, 2018 and then adjusted to account for the drivers of TNC vehicles. The average occupancy of private vehicles was assumed to be like the average number of passengers in TNCs.



Terminal were reserved for vehicles with four or more occupants, and these spaces were filled, the average vehicle occupancy would increase from 2.41 to 2.52 people per vehicle.

This measure is one of the few that is most effective when the parking supply is not a limiting factor on the number of attendees who drive and park. With unconstrained parking conditions, the increase in average vehicle occupancy directly decreases the number of vehicles driving to the ballpark. The measure still has an impact under constrained parking conditions by reducing the number of displaced drivers, some of whom would have used a TNC otherwise. This measure would continue to be effective in low-attendance situations.

TNC Surcharge and Geofence

Under Project 1.0, a large percentage of ballpark attendees would use TNCs to access Howard Terminal. This is problematic in terms of vehicle trips, as an attendee who uses TNCs contributes twice as many trips compared to an attendee who drives their personal vehicle. In part, this high mode share is driven by the fact that while Howard Terminal is near downtown (and therefore near many potential attendees), it is nonetheless located a 20-minute walk away from the site. This causes fewer people to prefer to walk or find some other non-vehicular mode of transportation when an inexpensive alternative is provided in the form of TNCs.

This measure places a TNC geofence extending about 0.5 miles from the ballpark in all directions around the start and end times of baseball games and events and enforcement would be through the use of traffic control officers. On-site and designated off-site TNC pick-up/drop-off zones would still be available, but they would be priced at a premium using surcharges calibrated to reduce demand to within their capacities. This measure makes TNC use less convenient and more expensive, shifting people towards other modes with fewer or no associated vehicle trips. This measure has the greatest reduction effect on TNC users in the closest-in areas because there are multiple alternative options, including walking, bicycling, and shared micro-mobility. Areas approaching five miles out and further, by contrast, would experience relatively less impact because there are fewer convenient alternatives to TNC use.

The overall impact of this measure is large, not because it changes the travel behavior of many attendees, but because those attendees whose behavior it does change have a disproportionate impact. TNC users who switch to zero-trip modes have twice the trip reduction impact of drivers who switch to zero-trip modes. This measure is particularly powerful when paired with parking reduction strategies, as it incentivizes displaced drivers to use BART or other modes rather than counterproductively (from a VTR perspective) switching to TNCs.



1.4.1.5 More Walking and Bicycling

The following measures reduce vehicle trips by increasing the number of attendees who are likely to walk or bike to attend games or events at the ballpark.

Develop Howard Terminal

Developing the western side of Howard Terminal with residential and office buildings (among other uses) would increase the number of potential attendees within easy walking distance of the ballpark. Residents and workers in these buildings would walk or bicycle to attend baseball games or events at the ballpark. This measure would cause the geographic shift of attendees due to the ballpark's relocation to Howard Terminal to be more pronounced towards close-in attendees, and it is assumed that one percent of residents and workers at Howard Terminal would attend.

Valet Bicycle Parking

Under Project 1.0, no special accommodations are made for attendees who choose to bicycle. As such, bicyclists must lock their bicycles to bike racks on the streets outside of Howard Terminal, which are limited in number and pose theft concerns.

This measure would provide a free bicycle valet parking service that could accommodate at least 500 bicycles, providing attendees who wish to bicycle to the ballpark a conveniently located, free, and secure place to store their bicycle while at the ballpark. By improving bicycling options, this measure reduces vehicle trips for attendees within five miles who otherwise may have chosen to use a TNC or drive themselves.

1.5 BALLPARK PROJECT 2.0

To meet the requirements for CEQA streamlining under AB 734, the Howard Terminal Ballpark must implement a TMP that achieves a vehicle trip reduction of 20 percent compared to Project 1.0 without the program. Although the components of this program have not been finalized, they will draw from the menu of TMP options presented in the previous section (Section 1.4). This memorandum uses one potential mix of measures that achieves a 20 percent VTR, defined as Project 2.0, but the final suite of measures is subject to change. For the purposes of this memorandum, Project 2.0 is assumed to consist of the following measures:

- Reduced On-Site Parking Spaces
- On-Street Parking Management
- TNC Surcharge and Geofence
- Develop Howard Terminal
- Bicycle Parking



1.5.1 BALLPARK PROJECT 2.0 MODE SHARE, TRIP GENERATION AND VTR

The process described previously in this memo was used to estimate attendee mode choice for baseball games and concerts under Project 2.0. The estimated arrival mode share of attendees for each type of baseball game and concerts is presented in **Table 7**. The vehicle trip generation estimates and associated VTR for baseball games and concerts are presented in **Table 8**.

TABLE 7: PROJECT 2.0 BALLPARK ATTENDEE ARRIVAL MODE

Scenario	Weekday Evening	Weekday Day	Weekend	Concert
Drive	50%	39%	50%	62%
TNC	13%	15%	14%	10%
Walk	3%	4%	3%	5%
Bike	1%	2%	1%	1%
Ferry	1%	<1%	<1%	<1%
Bus	1%	2%	1%	1%
BART	31%	38%	31%	20%

Source: Fehr & Peers, 2018.

TABLE 7: BALLPARK VEHICLE TRIP GENERATION AND VTR

Scenario	Weekday Evening ¹	Weekday Day ¹	Weekend ¹	Concert ^{2, 3}	Weighted Average ⁴
Project 1.0	27,400	27,800	28,600	22,800	27,400
Project 2.0	22,200	20,800	22,900	19,600	21,900
VTR	19%	25%	20%	14%	20%

Notes:

1. Includes 35,000 attendees and 1,320 employees
2. Includes 28,000 attendees and 1,200 employees
3. The concert venue trip generation can be adjusted based on attendance and staff to represent the other smaller events, corporate / community events, and plaza events anticipated to be held at the ballpark.
4. Weighted average calculated based on 41 weekday evening games, 14 weekday day games, 27 weekend games, and 9 concerts.

Source: Fehr & Peers, 2018.



1.5.2 ESTIMATED VTR ASSOCIATED WITH VARIOUS BALLPARK TMP MEASURES

Measures included in Project 2.0 are not finalized, and some assumed to be included in this analysis may be removed, while others from the menu, described in Section 1.4, may be added. **Table 9** presents the estimated VTR of individual measures discussed in this memorandum, with estimates provided in the context of the Project 2.0 defined for this memo. VTR estimates for measures that are included in Project 2.0 represent how much less VTR would be achieved without that measure, and VTR estimates for measures that are not included in Project 2.0 represent how much additional VTR would be achieved with that additional measure.

TABLE 9: DESCRIPTION OF BALLPARK TMP MEASURES AND VTR ESTIMATE

TMP Measure	Description	VTR Estimate
Reduced On-Site Parking Spaces	Reduce the number of on-site parking spaces available for ballpark attendees to 3,500	5-9%
On-Street Parking Management	At nearby on-street parking spaces introduce gameday time restrictions that prevent use by ballpark attendees	2-3%
BART Shuttles	Gameday shuttles between 12th Street BART station and the ballpark	1-3%
	Additional gameday shuttles between West Oakland and Lake Merritt BART stations and the ballpark	1%
Gondola	Gondola service between 12th Street and the ballpark	4-7%
Special Event Ferries and Water Taxis	Gameday and special event ferry (one ferry) to Oakland Jack London Square ferry terminal from either Alameda, Richmond or Vallejo	1%
Improved AC Transit Service	Move bus stops to provide high-frequency AC Transit service adjacent to the ballpark	1%
Transit Reimbursement	Price of transit trip is included in the ticket price, redeemed upon scanning Clipper card inside ballpark gates	1-2%
Carpool Preference	Reserve the closest 30% of on-site parking spaces for vehicles with 4+ occupants	1-3%
TNC Surcharge and Geofence	Before and after ballpark games and events, TNC users pay a surcharge to pick-up/drop-off on-site or at the designated pick-up/drop-off zone. All other TNCs geofenced for 0.5 miles from the ballpark in all directions.	9-14%
Develop Howard Terminal	Develop Howard Terminal with high-density housing and office uses	<1%
Bicycle Valet Parking	Provide a free bicycle valet parking service for at least 500 bicycles	2%

Source: Fehr & Peers, 2018.





2 ANCILLARY DEVELOPMENT

On the western side of Howard Terminal, the project would eventually displace the surface parking that would be provided on opening day of the ballpark with a multi-block mixed-use development that includes residential, office, retail, restaurant, and hotel land uses. As with the eastern side of the site, the western side is currently used to support operations at the Port of Oakland, with truck parking, container storage, and longshoreman training and administration. Up to 3,000 multifamily residential dwelling units, 1.5 million square feet of office-related space, 270,000 square feet of retail and restaurant space, 400 hotel rooms, and a 3,500-seat performance theater would be developed.

Like the Howard Terminal Ballpark analysis, Project 1.0 is defined as building the project at Howard Terminal with no consideration for TDM measures and where all vehicle demand is met. It does, however, reflect the site's mix of uses and proximity to transit and complimentary land uses. Project 2.0 implements measures to achieve a VTR of 20 percent or more.

2.1 PROJECT 1.0 TRIP GENERATION

Per City of Oakland guidelines for the ancillary development land uses, trip generation estimates for Project 1.0 were established using trip generation data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual (10th Edition)* as a starting point. The residential units were assumed to be in high-rise apartment buildings of more than 10 floors. Although the performance venue would only be in use roughly 50 days per year, it is included in these calculations to present trip generation on days where all land uses are operating. **Table 10** summarizes the Project 1.0 trip generation for the proposed project.

Although the ITE trip generation rates account for pedestrian, bicycling, and transit trips, ITE data is generally based on single-use suburban sites, and the methodology tends to overestimate the automobile trip generation for mixed-use developments located in urban environments with surrounding pedestrian, bicycle, and transit infrastructure. Given the Howard Terminal site's proximity to multiple high-frequency transit nodes (including the 12th Street Oakland City Center BART station and West Oakland BART station, both about 0.9 miles away), existing and planned pedestrian and bicycle infrastructure, and density and mix of land uses included in the project and in the surrounding neighborhoods, it is likely that a substantial percentage of trips generated by the project will utilize modes other than an automobile.



TABLE 8
HOWARD TERMINAL ANCILLARY DEVELOPMENT PROJECT 1.0
AUTOMOBILE TRIP GENERATION

Land Use	ITE Code	Size ¹	Daily Trips		
			Weekdays	Saturdays	Sundays
Residential ²	222	3,000 DU	12,000	12,400	9,800
Office ³	710	1,500 KSF	14,700	3,300	1,100
Retail ⁴	820	180 KSF	9,000	12,800	5,900
Restaurant ⁵	932	90 KSF	10,100	11,700	11,700
Hotel ⁶	310	400 rooms	4,100	3,600	2,900
Performance Venue ⁷	-	3,500 seats	4,100	4,100	4,100
ITE Trip Generation Subtotal			54,000	47,900	35,500
<i>Non-Auto Reduction⁸</i>			-14,000	-13,100	-9,900
Adjusted Total Project 1.0 Auto Trips			40,000	34,800	25,600

Notes:

1. DU = Dwelling Units, KSF = 1,000 square feet.
2. ITE *Trip Generation (10th Edition)* land use category 222 (High-Rise Apartment):
Weekdays: $T = 3.94 * X + 211.81$
Saturdays: $T = 4.08 * X + 185.69$
Sundays: $T = 3.21 * X + 156.83$
3. ITE *Trip Generation (10th Edition)* land use category 710 (General Office Building):
Weekdays: $\ln(T) = 0.97 * \ln(X) + 2.5$
Saturdays: $T = 2.21 * X$
Sundays: $T = 0.7 * X$
4. ITE *Trip Generation (10th Edition)* land use category 820 (Shopping Center):
Weekdays: $\ln(T) = 0.68 * \ln(X) + 5.57$
Saturdays: $\ln(T) = 0.62 * \ln(X) + 6.24$
Sundays: Fitted rate not available. Ratio of average rates between Saturday and Sunday (46.12 for Sat, 21.10 for Sun) applied to Saturday trip generation.
5. ITE *Trip Generation (10th Edition)* land use category 932 (High Turnover (Sit-Down) Restaurant):
Weekdays: $T = 11.29 * X - 426.97$
Saturdays and Sundays: $T = 130.5 * X$ (weighted average of ITE Saturday and Sunday rates used due to small sample sizes)
6. ITE *Trip Generation (10th Edition)* land use category 310 (Hotel):
Weekdays: $T = 11.29 * X - 426.97$
Saturdays: $T = 9.62 * X - 294.56$
Sundays: $T = 8.56 * X - 538.12$
7. Unadjusted trip generation for the performance venue was derived assuming a sold-out event with 2.15 attendees per vehicle, 200 employees in single-occupant vehicles, and 12% of vehicles as TNCs.
8. Reductions of 26.0%, 27.4%, and 27.9% assumed for Weekday, Saturday, and Sunday, respectively, based on results from MXD model.

Source: Fehr & Peers, 2019.



In response to limitations in the ITE methodology, and to provide a straightforward and empirically-validated method of estimating vehicle trip generation at mixed-use developments, the US Environmental Protection Agency (EPA) sponsored a national study of the trip generation characteristics of multi-use sites. Travel survey data was gathered from 239 mixed-use developments (MXDs) in six major metropolitan regions to develop the EPA MXD model, which estimates an external vehicle trip reduction percentage as a function of the characteristics of the site and the surround area. The inputs to this model include the overall size and density of the development, mix of employment and residents, internal connectivity, availability of transit service, and the density of trip destinations near the project site.

The MXD model estimates that the project's daily external vehicle trips for weekdays, Saturdays, and Sundays would be reduced by about 26 percent, 27 percent, and 28 percent, respectively, compared to the ITE rates. These trip reduction percentages include external trips by walking, bicycling, and transit, as well as trips captured internally by the project due to its mix of land use types. The design and size of the site ensures that almost all internal trips would be via non-automobile modes, so these percentages can conservatively be assumed to represent total automobile trip reduction for the project compared to ITE rates.

Automobile trip reduction percentages estimated by the MXD model validate the City of Oakland's Transportation Impact Review Guidelines (TIRG) adjustments for peak hour trips. The TIRG uses US Census commute data to apply a 37-percent automobile trip reduction to account for non-automobile commute trips for sites between 0.5 and 1.0 miles from a BART station. This estimate is very similar to the MXD model's vehicle trip reduction estimates for peak commuting hours, which return a 38-percent reduction in the AM peak and a 34-percent reduction in the PM peak.

An additional trip generation reduction for pass-by trips (trips attracted to the project site from adjacent roadways as an intermediate stop on the way to some other final destination) was not applied to the retail component of this analysis because internal pass-by trips are accounted for in the MXD model calculations, and the Howard Terminal site's location on the waterfront has limited connection to external roadways supporting pass-by trips.

As summarized in Table 10, the net new daily automobile trip generation for the ancillary development project in the Project 1.0 would be approximately 40,000 on weekdays, 34,800 on Saturdays, and 25,600 on Sundays.



2.1 PROJECT 1.0 AUTOMOBILE OWNERSHIP AND USE

Under Project 1.0, the Howard Terminal developments would provide a similar amount of parking and experience similar travel behavior as in nearby areas with similar land uses.

2.1.1 Residential

Automobile use at residential locations is a function of the number of automobiles available for household to use, as well as demographic composition of residents, mix of nearby land uses, and convenience of other transportation options. Based on US Census data, **Table 11** summarizes vehicle ownership for households with employed residents in the census tract adjacent to Howard Terminal in Jack London District bounded by Martin Luther King Jr Way, and 5th and Alice Streets.

TABLE 9
EXISTING VEHICLE OWNERSHIP FOR EMPLOYED RESIDENTS

Vehicles Available	Percent of Households with Employed Residents
No vehicle available	4%
1 vehicle available	56%
2 vehicles available	37%
3 or more vehicles available	3%
Average Vehicles per Household	1.4

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates, Alameda County Census Tract 9832, Table B08203.

This census tract has similar demographics as anticipated at Howard Terminal, a similar mix of nearby land uses, and a somewhat closer proximity to transit. Table 11 presents a conservative estimate of the likely rate of vehicle ownership of Howard Terminal residents in Project 1.0 where no additional TDM measures are put in place. According to this data, the average household in this tract owns 1.4 vehicles, which is used as the estimate of Project 1.0 residential parking demand.

2.1.2 Office

Automobile use at offices is a function of the availability of parking, as well as the type of employment, demographics of the workers, and convenience of other transportation options. Based on US Census data, **Table 12** summarizes mode share for workers commuting to the Downtown Oakland and Jack London District census tracts bounded by Martin Luther King Jr Way,



14th Street, and Alice Street. The table also presents the vehicle trips and parking demand per worker for each commute mode and calculates the overall rates of each for these census tracts.

TABLE 10
EXISTING COMMUTE MODE OF TRAVEL, VEHICLE TRIPS, AND PARKING DEMAND

Mode	Mode Share	Daily Commute Vehicle Trips per Worker	Parking Demand per Worker
Drive Alone	57%	2	1
2-person Carpool	8%	1	0.5
3-person Carpool	2%	0.67	0.33
Bus	6%	0	0
BART	18%	0	0
Ferry	2%	0	0
Bike	2%	0	0
Walk	4%	0	0
Taxi	1%	4	0
Total	100%	1.3	0.6

Source: U.S. Census Bureau, 2006-2010 Census Transportation Planning Products 5-Year Data Set, Alameda County Census Tracts 4030, 4031, and 9832, Table B206200C; Fehr & Peers, 2018.

While types of employment and demographics of workers at Howard Terminal are anticipated to be like those in Downtown Oakland, downtown has greater transit accessibility. As such, Table 12 presents a conservative estimate of the Project 1.0 parking demand and commute vehicle trips per worker for office uses at Howard Terminal. According to this data, the average worker in these tracts has parking demand of 0.6 spaces and is responsible for 1.3 automobile commute trips. Assuming an average square footage per worker of 225 (including lobbies and common areas), parking demand for the Project 1.0 office component is about 2.7 spaces per thousand square feet.

2.1.3 Retail and Restaurant

Parking demand for retail and restaurant components of the development was derived using data from ITE's *Parking Generation (4th Edition)*, which estimates hourly parking demand for each land use type by day of the week and, for retail uses, month of the year. These uses were assumed to



share the same parking spaces. Using the square footages provided for each use, combined hourly parking demand for these uses was estimated for non-Friday weekdays, Fridays, Saturdays, and Sundays, for non-December months and December. Under Project 1.0, enough parking would be provided for retail and restaurant uses to meet parking demand at the busiest time of year, which would represent a parking ratio of about 5.6 spaces per thousand square feet.

2.1.4 Hotel

Data regarding parking demand for hotel uses in the project area is not readily available. However, the City of Oakland municipal code (section 17.116.060) requires a minimum of 0.5 spaces per room for hotels in most of the city, including in the Jack London District bordering Howard Terminal. This minimum requirement is therefore conservatively assumed to represent parking demand for hotel uses in the absence of TDM measures.

2.1.5 Performance Venue

Parking demand at the performance venue can be derived for a sold-out event with 200 employees by assuming a 27 percent non-automobile mode share (using MXD weekend trip reduction rates), 2.15 attendees per vehicle, and 12% TNC share of vehicles. Using these assumptions, 1,200 parking spaces would be needed under Project 1.0 where all parking demand is met. The ballpark and performance venue would share the same parking.

2.2 PROJECT 2.0 TDM PROGRAM COMPONENTS

To meet the requirements for CEQA streamlining under AB 734, the Howard Terminal project must implement a TDM program for the ancillary development that achieves a vehicle trip reduction of 20 percent compared to the Project 1.0 without the TDM program. Defined as Project 2.0, the TDM program for the ancillary development component of the project will include three components:

- Reduced Parking Supply
- Physical Improvements
- On-going Operational Strategies

The rest of this section describes these components in detail.

2.2.1 Reduced Parking Supply

The primary driver of trip reductions in Project 2.0 for the ancillary development at Howard Terminal is a substantial reduction in the allowable parking supply compared to Project 1.0, which allowed for a similar amount of parking as demanded in neighboring areas. This TDM measure achieves



VTR by physically restricting the number of vehicles that are able to be parked and stored at Howard Terminal, forcing some residents, office workers, and retail/restaurant customers to choose other modes who otherwise would have driven a vehicle.

Parking maximums would apply to residential, office, and retail/restaurant components that are substantially lower than existing demand, and no parking minimums would be applied. For the hotel and performance venue, parking would be capped at the estimated current level of parking demand. While maximums set at the level of existing demand would not induce VTR, they would help ensure that vehicle trips for these uses do not exceed Project 1.0 estimated trip generation.

Table 13 presents the Project 1.0 level of parking demand for each of the ancillary development land uses at Howard Terminal, as well as the parking maximum instituted by Project 2.0.

**TABLE 11
PROJECT 2.0 PARKING MAXIMUMS**

	Residential	Office	Retail and Restaurant	Hotel	Performance Venue
Project 1.0 Parking Demand	1.4 per DU	2.7 per KSF	5.6 per KSF	0.50 per room	1,200
Project 2.0 Parking Maximum	1.0 per DU	2.0 per KSF	2.6 per KSF	0.50 per room	1,200

Sources: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates, Alameda County Census Tract 9832, Table B08203; 2006-2010 Census Transportation Planning Products 5-Year Data Set, Alameda County Census Tracts 4030, 4031, and 9832, Table B206200C; City of Oakland; Fehr & Peers, 2018.

2.2.2 Physical Improvements

Under Project 2.0, the development at Howard Terminal would also implement physical improvements that encourage the use of non-automobile modes. These elements are required by the City of Oakland, as described in the TIRG, and are typically considered on a development-by-development basis, with many of the elements related to improving existing transportation facilities. As this project would be building the internal roadway network from scratch, these elements would be used as a guide to develop the facilities provided on these roadways. The City of Oakland's physical TDM strategies are presented in **Table 14**, along with their applicability to the Howard Terminal project.



TABLE 12
APPLICATION OF CITY OF OAKLAND TDM PROGRAM COMPONENTS

TDM Strategy	Required When	Required for Proposed Project?
Bus boarding bulbs or islands	<ul style="list-style-type: none"> A bus boarding bulb or island does not already exist, and a bus stop is located along the project frontage; and/or bus stop along project frontage serves a route with 15 minutes or better peak hour service and has a shared bus-bike lane curb 	No, bus stops would not be provided at the project site
Bus shelter	<ul style="list-style-type: none"> A stop with no shelter is located within the project frontage, or The project is located within 0.10 miles of a flag stop with 25 or more boardings per day 	No, bus stops would not be provided at the project site
Concrete bus pad	<ul style="list-style-type: none"> A bus stop is located along the project frontage and a concrete bus pad does not already exist 	No, bus stops would not be provided at the project site
Curb extension / bulb-outs	<ul style="list-style-type: none"> Identified as an improvement within site analysis 	Yes , bulb-outs would be provided on-site with on-street parking
Implementation of a corridor-level bikeway improvement	<ul style="list-style-type: none"> A buffered Class 2 or Class 4 bikeway facility is in a local or county adopted plan within 0.10 miles of the project location; and The project would generate 500 or more daily bicycle trips 	Yes , project would construct Class 2 bike lanes on Market Street connecting the site to 3 rd Street, Class 2 bike lanes on 3 rd Street connecting to Martin Luther King Jr Way, Class 2 bike lanes on Martin Luther King Jr Way connecting 2 nd and 3 rd Street, Class 2 bike lanes on 2 nd Street connecting to Jefferson Street and a bicycle and pedestrian railroad over crossing to the site.
Implementation of a corridor-level transit capital improvement	<ul style="list-style-type: none"> A high-quality transit facility is in a local or county adopted plan within 0.25 miles of the project location; and The project would generate 400 or more peak period transit trips 	Yes , project would upgrade transit stops nearest the project for Line 72/72M/72R through coordination with AC Transit and Oakland
Install pedestrian amenities such as lighting; green infrastructure, trees, or other greening landscape; trash receptacles per the Pedestrian Master Plan and applicable streetscape plan	<ul style="list-style-type: none"> Always required 	Yes , project would install pedestrian amenities at the site
Installation of safety improvements identified in the Pedestrian Master Plan (such as crosswalk striping,	<ul style="list-style-type: none"> When improvements are identified in the Pedestrian Master Plan along project frontage or at an adjacent intersection 	Yes , project would provide pedestrian improvements, including railroad safety improvements



TABLE 12
APPLICATION OF CITY OF OAKLAND TDM PROGRAM COMPONENTS

TDM Strategy	Required When	Required for Proposed Project?
curb ramps, count down signals, bulb outs, etc.)		
In-street bicycle corral	<ul style="list-style-type: none"> A project includes more than 10,000 square feet of ground floor retail, is located along a Tier 1 bikeway, and on-street vehicle parking is provided along the project frontages. 	Yes , in-street bicycle corrals would be provided on-site that meet these criteria
Intersection improvements, including but not limited to visibility improvements, shortening corner radii, pedestrian safety islands, accounting for pedestrian desire lines.	<ul style="list-style-type: none"> Identified as an improvement within site analysis 	Yes , on-site intersections would be designed to address these concerns
New sidewalks, curb ramps, curbs and gutters meet current City and ADA standards	<ul style="list-style-type: none"> Always required 	Yes , all on-site sidewalks, curb ramps, curbs and gutters would meet current City and ADA standards
No monthly permits and establish minimum price floor for public parking	<ul style="list-style-type: none"> If proposed parking ratio exceeds 1:1000 sf (commercial) 	Yes , no monthly permits offered, a price floor would be established for all commercial developments, regardless of parking ratio
Parking garage is designed with retrofit capability	<ul style="list-style-type: none"> Optional if proposed parking ratio exceeds 1:1.25 (residential) or 1:1000 sf (commercial) 	Yes , commercial developments exceeding a 1:1000 sf parking ratio would be designed with retrofittable garages
Parking space reserved for car share	<ul style="list-style-type: none"> A project is located within downtown (CBD and D-LM zones). One car share space preserved for buildings between 50 – 200 units, then one car share space per 200 units. 	Yes , project would car share parking
Paving, lane striping or restriping (vehicle and bicycle), and signs to midpoint of street section	<ul style="list-style-type: none"> Typically required 	Yes , project would construct all new streets
Pedestrian crossing improvements and supportive signal changes such as reducing cycle lengths to less than 90 seconds, leading pedestrian interval, "scramble" signal phase where appropriate.	<ul style="list-style-type: none"> Identified as an improvement within site analysis Identified as an improvement within operations analysis 	Yes , pedestrian crossing improvements would be provided on-site where appropriate



TABLE 12
APPLICATION OF CITY OF OAKLAND TDM PROGRAM COMPONENTS

TDM Strategy	Required When	Required for Proposed Project?
Real-time transit information system	<ul style="list-style-type: none"> A project frontage block includes a bus stop or BART station and is along a Tier 1 transit route with 2 or more routes or peak period frequency of 15 minutes or better 	No, project is located almost one mile from BART
Relocating bus stops to far side	<ul style="list-style-type: none"> A project is located within 0.10 mile of any active bus stop that is currently near-side 	No, bus stops would not be provided on-site
Signal upgrades, including typical traffic lights, pedestrian signals, bike actuated signals, transit only signals	<ul style="list-style-type: none"> Project size exceeds 100 residential units, 80,000 sf of retail, or 100,000 sf of commercial; and Project frontage abuts an intersection with signal infrastructure older than 15 years 	Yes , all traffic signals would meet city standards in effect at the time of upgrade or installation
Transit queue jumps	<ul style="list-style-type: none"> Identified as a needed improvement within operations analysis of a project with frontage along a Tier 1 transit route with 2 or more routes or peak period frequency of 15 minutes or better 	No, project site would not contain any transit routes
Trenching and placement of conduit for providing traffic signal interconnect	<ul style="list-style-type: none"> Project size exceeds 100 units, 80,000 sf of retail, or 100,000 sf of commercial; and Project frontage block is identified for signal interconnect improvements as part of a planned ITS improvement; and A major transit improvement is identified within operations analysis requiring traffic signal interconnect 	Yes , project would ensure that new traffic signal installations are interconnected to city standards at the time of installation as well as upgraded intersections
Unbundled parking	<ul style="list-style-type: none"> New multifamily dwelling residential facilities of ten (10) or more units, with the exception of affordable housing 	Yes , project would provide unbundled parking for all residential and office developments

Sources: City of Oakland Transportation Impact Review Guidelines, 2017 and City of Oakland Municipal Code, 2018

2.2.3 On-Going Operational Strategies

Project 2.0 would also implement on-going operational strategies to support the use of non-auto transportation modes. The potential operational strategies to be considered as development occurs are summarized below:

- Unbundled Parking* – Unbundle parking costs from housing costs (as required by Oakland Municipal Code, Section 17.116.310). This would result in residents paying one price for the residential unit and a separate price for parking, should they opt for a space. The price of a parking space would be adjusted so that resident parking demand matches the building's



parking supply. Similarly, offices would not be allowed to include parking as part of the rent and would instead rent out office space and parking spaces separately.

- *Pre-tax Commuter Benefits* – Encourage project tenants to enroll in WageWorks or other service to help with pre-tax commuter savings. This strategy allows employees to deduct monthly transit passes or other amount using pre-tax dollars. This can help to lower payroll taxes and allows employees to save on transit.
- *Carshare Parking Spaces* – For residential developments, dedicate for free at least the minimum number of on-site parking spaces the City of Oakland Municipal Code Section 17.116.105 requires be made available for carsharing in downtown zones. For office developments, dedicate at least one on-site parking space for carsharing. For hotel developments, dedicate for free at least one on-site parking space for carsharing, if on-site parking is provided.
- *Guaranteed Ride Home* – Encourage project commercial tenants to register their employees and promote the Alameda County Transportation Commission Guaranteed Ride Home (GRH) program. GRH programs encourage the use of alternative modes of transportation by offering free rides home if an illness or crisis occurs, if the employee is required to work unscheduled overtime, if a carpool or vanpool is unexpectedly unavailable, or if a bicycle problem arises. The Alameda County Transportation Commission offers their GRH service for all registered permanent employees who are employed within Alameda County, live within 100 miles of their worksite, and do not drive alone to work. The GRH program is offered at no cost to the employer, and employers are not required to register in order for their employees to enroll and use the program. The GRH program can also apply to future employed residents of the project.
- *Bicycle Parking Supply and Monitoring* – Meet or exceed the City of Oakland's minimum requirements for bicycle parking established in Section 17.117. Building management would monitor the usage of these facilities and provide additional bicycle parking, if necessary.
- *TDM Coordinator* – Building management would designate a TDM coordinator for the building who will provide tenants and employees information about transportation options in the project area and the TDM strategies provided by the building. In addition, each commercial tenant would designate a staff person as their TDM coordinator to coordinate, monitor and publicize TDM activities. Information about transportation options and TDM strategies would be posted at central locations and provided to building tenants, to be updated as necessary. Marketing strategies can promote alternative trips by making commuters aware of the options and incentives of using non-automobile transportation. Implementing commute trip reduction strategies with a complementary marketing strategy can increase the overall effectiveness of the program. This information would include:
 - *Commuter Benefits Program* – Provide information on the Bay Area Commuter Benefits Program (Air District Regulation 14, Rule 1). Employers with 50 or more full-time



employees within the Bay Area Air Quality Management District (Air District) geographic boundaries are required to register and offer one of four commuter benefits to their employees: a pre-tax benefit, an employer-provided subsidy, employer-provided transit, or an alternative commute benefit. (Information about Commute Benefits Program is at 511.org/employers/commuter/overview.)

- *Transit Routes* – Promote the use of transit by providing user-focused maps. These maps provide residents with wayfinding to nearby transit stops and transit-accessible destinations and are particularly useful for those without access to portable mapping applications. Project developments would consider installing real-time transit information, such as TransitScreen, in visible locations to provide residents and employees with up-to-date transit arrival and departure times.
- *Transit Fare Discounts* – Provide information about local discounted fare options offered by BART and AC Transit, including discounts for youth, elderly, persons with disabilities, and Medicare cardholders.
- *Car Sharing* – Promote accessible car sharing programs, such as Zipcar and Getaround, by informing residents and employees of on-site and nearby car sharing locations and applicable membership information.
- *Ridesharing* – Provide residents and employees with phone numbers and contact information for ride sharing options including Uber, Lyft, and Oakland taxi cab services.
- *Carpooling* – Provide residents and employees with phone numbers and contact information for carpool matching services such as the Metropolitan Transportation Commission's 511 RideMatching.
- *Walking and Biking Events* – Provide information about local biking and walking events, such as Oaklavia, as events are planned.
- *Bikeshare* – Educate residents and employees about nearby bike sharing station locations and membership information.

2.3 ANCILLARY DEVELOPMENT PROJECT 2.0 VTR ESTIMATES

The calculation of Project 2.0 VTR estimates for the ancillary development at Howard Terminal is mostly driven by parking reductions, as the impacts of the physical improvements and on-going operational strategies are not as easy to accurately model. For the purposes of this memorandum, all the physical improvements and operational strategies were assumed to have a combined VTR of two percent of trips not already reduced by parking reductions. This represents a conservative assumption, as research from the California Air Pollution Control Officers Association in *Quantifying*



Greenhouse Gas Mitigation Measures (August 2010) suggests that some of the individual TDM components included in these categories may approach that level of impact by themselves.

To calculate the VTR impact of parking reductions for residential uses, it was assumed that vehicle trips are reduced in equal proportion to vehicle ownership. This assumption is supported by the 2017 National Household Travel Survey, which found that households with one vehicle had less than half the annual VMT of households with two vehicles, although this did not control for location. In addition, the difference between one- and two-vehicle households was negligible for TNC/Taxi mode share of overall trips, so the effect of mode shift to TNCs was considered negligible.

The number of trips for the office component was assumed to be proportional to the number of spaces provided. Most office trips occur as part of the daily commute, and a reduction in the number of spaces reduces the number of potential driving commuters.

For the retail/restaurant component, the number of spaces provided in Project 2.0 was compared to the parking demand for each hour of each day type for non-December and December months. When parking demand was in excess of parking supply, vehicles in excess of supply were assumed to shift modes or otherwise eliminate their vehicle trip due to the inability to park. The total number of vehicles to successfully park over the course of one year was compared to the total annual parking demand to estimate VTR.

Table 15 presents the trip generation and VTR estimates for each component of the Howard Terminal ancillary development for a typical weekday and weekend. Although the weekend VTR shown in Table 15 is less than a 20 percent reduction, the table corresponds to a yearly VTR of over 20 percent, as the VTR from weekdays in excess of 20 percent would make up the difference over a one-year period.

Table 15 presents overall development VTR on days with and without the performance venue which would only be in operation about 50 days per year. The estimates for the hotel do not consider its use for visiting baseball team operations on the 81 or more gamedays per year. If the use of half of the hotel for that purpose is considered part of Project 2.0 (but not Project 1.0), then an additional 1 to 2 percent VTR for the development would be achieved on those days.



TABLE 13
VTR ESTIMATES FOR HOWARD TERMINAL ANCILLARY DEVELOPMENT

Land Use	Weekday			Weekend		
	Project 1.0	Project 2.0	VTR	Project 1.0	Project 2.0	VTR
Residential	8,900	6,300	-30%	8,000	5,700	-30%
Office	10,900	7,800	-28%	1,600	1,100	-28%
Retail	6,600	5,500	-17%	6,800	5,600	-18%
Restaurant	7,500	6,200	-17%	8,500	7,000	-18%
Hotel	3,000	3,000	-0%	2,300	2,300	-0%
Performance Venue	3,000	3,000	-0%	3,000	3,000	-0%
Total With Venue	39,900	31,800	-20%	30,200	24,700	-18%
Total Without Venue	36,900	28,800	-22%	27,200	21,700	-20%

Source: Fehr & Peers, 2019.

2.4 IMPACT OF GONDOLA ON ANCILLARY DEVELOPMENT

A gondola between Howard Terminal and Downtown Oakland may be provided as a part of the final suite of TDM measures for the ballpark component of the project. Unlike other ballpark TDM measures, which would primarily affect travel related to ballpark events, a gondola would be available for the daily use of residents and workers of the ancillary development and others in the Jack London District. By improving non-automobile access between Howard Terminal and the offices, residents, retail, entertainment, and transit stops of Downtown Oakland, the construction of a gondola would reduce daily vehicle trips to and from the ancillary development.

The VTR impact of the gondola on ancillary development can be estimated using the Oakland TIRG. The TIRG estimates that developments within 0.5 miles of a BART station have an additional 10 percent reduction in automobile trip generation compared to developments between 0.5 miles and 1.0 miles of a BART station. This implies that reducing the distance to a BART station by about a 10-minute walk would reduce automobile trip generation by about 10 percent. Travel time savings to the 12th Street Oakland City Center BART station provided by the gondola is expected to be 8- to 10-minutes, so the gondola would be expected to reduce Project 1.0 trip generation by 10 percent.



3 MONITORING, EVALUATION, AND ENFORCEMENT

The A's and the ancillary development community would monitor and refine the TMP and the TDM Plan for the ballpark and the ancillary development, respectively, in conjunction with the City of Oakland through field monitoring during the project's first two years of operations and an annual surveying and reporting program thereafter. The TMP and the TDM Plan will be continually refined by improving existing measures and introducing new strategies. All proposed and approved changes to either the TMP or the TDM Plan will be reported and referenced in the Annual Report.

3.1 MONITORING METHODS

The following methods will be employed to monitor the TMP and the TDM Plan strategies.

1. Quarterly Coordination Meetings – the on-site Transportation Coordinator and key Ballpark staff will meet quarterly with the City's designated representative, other key City staff, and other transportation service providers to evaluate the TMP and TDM Plan strategies. These meetings will occur during the first two years of the project, and then annually thereafter.
2. Inaugural Event Monitoring – a designated team of Ballpark and City staff will monitor pre-event and post-event transportation conditions at several of the first A's games and events held at the Ballpark, and collaboratively adjust improve transportation efficiencies.
3. Subsequent Event Monitoring - a designated team of Ballpark and City staff will monitor pre-event and post-event transportation conditions intermittently during the first four years of operation at the Ballpark.
4. Curb Pick-Up and Drop-Off Operations – the on-site Transportation Coordinator will regularly monitor curb operations during the first year of operation.
5. Event Attendee Surveys – annual travel surveys of at least 1,000 attendees will be conducted at five weekday evening games and at one weekday day game and one weekend game at the Ballpark. The surveys will identify such data as pre-event origin and post-event destination, arrival and departure times, arrival and departure modes, transit provider, parking location, number of vehicle occupants (auto mode), etc. The survey will be developed in coordination with the City of Oakland.
6. Ballpark Employee Surveys – annual travel surveys given to attendees will also be given to permanent and temporary employees to identify the same travel information for A's employees as well as to determine their awareness of alternative modes and travel demand management programs that are available to them. The A's will commit to a minimum of 60 percent survey completion rate. The survey will be developed in coordination with the City of Oakland.



7. Ancillary Development Employee and Resident Surveys – annual travel surveys given to employees and residents of the ancillary development will also be given to identify the same travel information for A's employees, as well as to determine their awareness of alternative modes and travel demand management programs that are available to them. The survey will be developed in coordination with the City of Oakland.
8. Parking Strategies – data will be collected on parking utilization rates, and effectiveness of on-site and off-site parking strategies, for all events.

3.2 MONITORING DOCUMENTATION

The results of the monitoring process will be documented as follows.

1. TMP Travel Survey Memorandum – a memorandum will be prepared within three months of the inaugural events (MLB game, special event) that documents the results of the initial travel surveys as well as ongoing event monitoring.
2. Annual Monitoring Report – a report will be developed and submitted to the City of Oakland annually, beginning one year following commencement of project construction and continuing for the life of the project. The Annual Monitoring Report shall summarize the current implementation and compliance status at the time of the report for all mitigation and improvement measures, and all TMP measures, for which the A's and ancillary development community have been assigned some or all reporting responsibility. For measures that another entity (e.g., a transit service provider) is responsible for implementing, the A's and the ancillary development community shall only report on readily available information about the implementation and compliance status. This Annual Monitoring Report may include the TMP and the TDM Plan monitoring surveys and reports that address how effectively the TMP and the TDM Plan is meeting the monitoring objective of reducing vehicle trips by 20 percent. It would also propose changes, adjustments, and improvements to the TMP and the TDM Plan, as needed.

3.3 PERFORMANCE STANDARDS

The TMP and the TDM Plan include various performance measures once the project is in operation and initial monitoring results are available, and the results will be measured against these criteria. If not achieved, the A's and the ancillary development community will be required to work with the appropriate agency or stakeholder group to ensure that the standards are met. The following performance standards have been developed specifically for AB 734 compliance and compliance with the City of Oakland Standard Conditions of Approval:

1. Vehicle Trip Reduction (VTR) of 20 percent for the ballpark events.



2. Vehicle Trip Reduction (VTR) of 20 percent for the ancillary development.

If ongoing monitoring shows that one or both performance standards are not being met, the A's and/or the ancillary development community will explore additional strategies, operational efforts, or minor redesigns to meet the 20 percent VTR goals. Revisions to policy will be brought before the City of Oakland.

Appendix A

Project 1.0 Assumptions

Project 1.0 Assumptions - Baseball - Arrivals

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART		
12TH	3%	3%	2%		0%	57%	40%	1%	0%	2%	0%	0%	57%	40%	1%	0%	2%	0%	0%	58%	41%	1%	0%	0%	0%	
19TH	3%	4%	2%		0%	73%	20%	2%	0%	5%	0%	0%	73%	20%	2%	0%	5%	0%	0%	72%	24%	2%	0%	2%	0%	
MCAR	2%	2%	2%		0%	60%	0%	0%	0%	0%	40%	0%	60%	0%	0%	0%	0%	40%	0%	60%	0%	0%	0%	0%	40%	
ASHB	1%	1%	1%		0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	
ROCK	2%	2%	2%		0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	
LAKE	3%	3%	3%		0%	51%	48%	1%	0%	0%	0%	0%	51%	48%	1%	0%	0%	0%	0%	51%	48%	1%	0%	0%	0%	
FTVL	3%	6%	4%		0%	50%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	50%	
WOAK	1%	1%	1%		0%	73%	25%	2%	0%	0%	0%	0%	73%	25%	2%	0%	0%	0%	0%	73%	25%	2%	0%	0%	0%	
EMBR	6%	4%	4%		0%	0%	0%	0%	30%	0%	70%	0%	0%	0%	0%	5%	0%	95%	0%	0%	0%	0%	5%	0%	95%	
MONT	5%	3%	2%		0%	0%	0%	0%	20%	0%	80%	0%	0%	0%	0%	3%	0%	97%	0%	0%	0%	0%	3%	0%	97%	

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART		
<1 mile from HT	3%	2%	1%		10%	23%	63%	2%	0%	2%	0%	10%	23%	63%	2%	0%	2%	0%	10%	23%	63%	2%	0%	2%	0%	
1-2 miles from HT	3%	3%	3%		20%	58%	15%	2%	0%	5%	0%	20%	58%	15%	2%	0%	5%	0%	20%	58%	15%	2%	0%	5%	0%	
2-5 miles from HT	26%	24%	25%		58%	40%	0%	0%	0%	2%	0%	58%	40%	0%	0%	0%	2%	0%	58%	40%	0%	0%	0%	2%	0%	
Richmond	1%	2%	2%		100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	
Near Coliseum	9%	9%	7%		50%	20%	0%	0%	0%	2%	28%	50%	20%	0%	0%	0%	2%	28%	50%	20%	0%	0%	0%	2%	28%	

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
HAYW	2%	2%	3%	20%	20%	20%
SHAY	1%	2%	1%	30%	30%	30%
UCTY	3%	4%	3%	40%	40%	40%
FRMT	4%	4%	5%	50%	50%	50%
WSPR	3%	3%	2%	60%	60%	60%
CAST	3%	2%	4%	20%	20%	20%
WDUB	4%	5%	5%	30%	30%	30%
DUBL	10%	8%	12%	40%	40%	40%

Current Vehicle Origins	Existing Coliseum Vehicle Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
20-25 mi SE of HT	5%	5%	5%	20%	20%	10%
25-30 mi SE of HT	4%	5%	5%	30%	30%	15%
30-40 mi SE of HT	4%	4%	4%	40%	40%	20%
40+ mi SE of HT	3%	5%	5%	50%	50%	25%

Shifts Towards

New Attendees Origins	% of Attendees Gained			Mode Split - Weekday Evening								Mode Split - Weekday Day								Mode Split - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART		
Oakland/Piedmont	50%	50%	50%		30%	31%	13%	1%	0%	3%	22%	30%	31%	13%	1%	0%	3%	22%	30%	31%	13%	1%	0%	3%	22%	
Central Contra Costa	20%	20%	20%		50%	10%	0%	0%	0%	40%	50%	10%	0%	0%	0%	0%	40%	50%	10%	0%	0%	0%	0%	40%		
San Francisco	20%	20%	20%		0%	0%	0%	0%	25%	75%	0%	0%	0%	0%	1%	0%	99%	0%	0%	0%	0%	1%	0%	99%		
Alameda	10%	10%	10%		70%	10%	0%	0%	10%	10%	0%	79%	10%	0%	0%	1%	10%	0%	79%	10%	0%	0%	1%	10%	0%	
Howard Terminal Development	0	0	0		0%	0%	98%	2%	0%	0%	0%	0%	0%	98%	2%	0%	0%	0%	0%	98%	2%	0%	0%	0%		

Project 1.0 Assumptions - Baseball - Departures

Mode Shift of Current BART Attendees

Current BART Destinations	Existing Coliseum BART Distribution			Drive	Mode Shift - Weekday Evening						Mode Shift - Weekday Day							Drive	Mode Shift - Weekend					
	Weekday Evening	Weekday Day	Weekend		TNC	Walk	Bike	Ferry	Bus	BART	TNC	Walk	Bike	Ferry	Bus	BART	TNC		Walk	Bike	Ferry	Bus	BART	
12TH	2%	2%	2%	0%	57%	42%	1%	0%	0%	0%	0%	57%	40%	1%	0%	2%	0%	0%	58%	41%	1%	0%	0%	0%
19TH	2%	4%	2%	0%	76%	22%	2%	0%	0%	0%	0%	73%	20%	2%	0%	5%	0%	0%	74%	24%	2%	0%	0%	0%
MCAR	3%	2%	2%	0%	60%	0%	0%	0%	0%	40%	0%	60%	0%	0%	0%	0%	40%	0%	60%	0%	0%	0%	0%	40%
ASHB	2%	2%	1%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%
ROCK	2%	2%	2%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	60%
LAKE	4%	4%	4%	0%	51%	48%	1%	0%	0%	0%	0%	51%	48%	1%	0%	0%	0%	0%	51%	48%	1%	0%	0%	0%
FTVL	4%	7%	6%	0%	50%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	50%
WOAK	1%	1%	1%	0%	73%	25%	2%	0%	0%	0%	0%	73%	25%	2%	0%	0%	0%	0%	73%	25%	2%	0%	0%	0%
EMBR	4%	5%	4%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	30%	0%	70%	0%	0%	0%	0%	20%	0%	80%
MONT	3%	2%	2%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	20%	0%	80%	0%	0%	0%	0%	15%	0%	85%

Mode Shift of Current Vehicles

Current Vehicle Destinations	Existing Coliseum Vehicle Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend							
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART			
<1 mile from HT	1%	2%	2%		10%	23%	63%	2%	0%	2%	10%	23%	63%	2%	0%	2%	0%	10%	23%	63%	2%	0%	2%	0%			
1-2 miles from HT	2%	5%	2%		20%	58%	15%	2%	0%	5%	20%	58%	15%	2%	0%	5%	0%	20%	58%	15%	2%	0%	5%	0%			
2-5 miles from HT	24%	24%	23%		58%	40%	0%	0%	0%	2%	58%	40%	0%	0%	0%	2%	0%	58%	40%	0%	0%	0%	2%	0%			
Richmond	2%	3%	1%		100%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%			
Near Coliseum	8%	9%	8%		50%	20%	0%	0%	0%	2%	50%	20%	0%	0%	0%	2%	28%	50%	20%	0%	0%	0%	2%	28%			

Geographic Shift of Current Attendees

Shifts Away

Current BART Destinations	Existing Coliseum BART Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
HAYW	3%	2%	3%	20%	20%	20%
SHAY	2%	2%	2%	30%	30%	30%
UCTY	3%	5%	3%	40%	40%	40%
FRMT	4%	5%	5%	50%	50%	50%
WSPR	4%	2%	2%	60%	60%	60%
CAST	3%	2%	5%	20%	20%	20%
WDUB	4%	5%	5%	30%	30%	30%
DUBL	11%	7%	12%	40%	40%	40%

Current Vehicle Destinations	Existing Coliseum Vehicle Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
20-25 mi SE of HT	5%	3%	5%	20%	20%	10%
25-30 mi SE of HT	4%	6%	5%	30%	30%	15%
30-40 mi SE of HT	4%	3%	4%	40%	40%	20%
40+ mi SE of HT	5%	4%	6%	50%	50%	25%

Shifts Towards

New Attendees Destinations	% of Attendees Gained			Drive	Mode Split - Weekday Evening								Mode Split - Weekday Day								Mode Split - Weekend							
	Weekday Evening	Weekday Day	Weekend		TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART				
Oakland/Piedmont	50%	50%	50%	50%	30%	31%	13%	1%	0%	3%	22%	30%	31%	13%	1%	0%	3%	22%	30%	31%	13%	1%	0%	3%	22%			
Central Contra Costa	20%	20%	20%	20%	50%	10%	0%	0%	0%	0%	40%	50%	10%	0%	0%	0%	0%	40%	50%	10%	0%	0%	0%	0%	40%			
San Francisco	20%	20%	20%	20%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	1%	0%	99%	0%	0%	0%	0%	1%	0%	99%			
Alameda	10%	10%	10%	10%	80%	10%	0%	0%	0%	10%	0%	79%	10%	0%	0%	1%	10%	0%	79%	10%	0%	0%	1%	10%	0%			
Howard Terminal Development	-	-	-	-	0%	0%	98%	2%	0%	0%	0%	0%	0%	98%	2%	0%	0%	0%	0%	0%	98%	2%	0%	0%	0%			

Project 1.0 Assumptions - Concerts - Arrivals

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
12TH	2%			0%	58%	41%	1%	0%	0%	0%
19TH	3%			0%	72%	24%	2%	0%	2%	0%
MCAR	2%			0%	60%	0%	0%	0%	0%	40%
ASHB	1%			0%	40%	0%	0%	0%	0%	60%
ROCK	2%			0%	40%	0%	0%	0%	0%	60%
LAKE	3%			0%	51%	48%	1%	0%	0%	0%
FTVL	4%			0%	50%	0%	0%	0%	0%	50%
WOAK	1%			0%	73%	25%	2%	0%	0%	0%
EMBR	5%			0%	0%	0%	0%	30%	0%	70%
MONT	2%			0%	0%	0%	0%	20%	0%	80%

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
<1 mile from HT	4%			10%	23%	63%	2%	0%	2%	0%
1-2 miles from HT	5%			20%	58%	15%	2%	0%	5%	0%
2-5 miles from HT	27%			58%	40%	0%	0%	0%	2%	0%
Richmond	2%			100%	0%	0%	0%	0%	0%	0%
Near Coliseum	7%			50%	20%	0%	0%	0%	2%	28%

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution		Percent of Distribution Lost	
	Weekend		Weekend	
HAYW	2%		20%	
SHAY	1%		30%	
UCTY	3%		40%	
FRMT	6%		50%	
WSPR	3%		60%	
CAST	2%		20%	
WDUB	3%		30%	
DUBL	8%		40%	

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Percent of Distribution Lost	
	Weekend		Weekend	
20-25 mi SE of HT	5%		10%	
25-30 mi SE of HT	5%		15%	
30-40 mi SE of HT	4%		20%	
40+ mi SE of HT	4%		25%	

Shifts Towards

New Attendees Origins	% of Attendees Gained	Weekend	Mode Split							
			Drive	TNC	Walk	Bike	Ferry	Bus	BART	
Oakland/Piedmont	50%			30%	31%	13%	1%	0%	3%	22%
Central Contra Costa	20%			50%	10%	0%	0%	0%	0%	40%
San Francisco	20%			0%	0%	0%	0%	1%	0%	99%
Alameda	10%			79%	10%	0%	0%	1%	10%	0%
Howard Terminal Devlopment	0%			0%	0%	98%	2%	0%	0%	0%

Project 1.0 Assumptions - Concerts - Departure

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
12TH	2%			0%	58%	41%	1%	0%	0%	0%
19TH	3%			0%	74%	24%	2%	0%	0%	0%
MCAR	2%			0%	60%	0%	0%	0%	0%	40%
ASHB	1%			0%	40%	0%	0%	0%	0%	60%
ROCK	2%			0%	40%	0%	0%	0%	0%	60%
LAKE	3%			0%	51%	48%	1%	0%	0%	0%
FTVL	4%			0%	50%	0%	0%	0%	0%	50%
WOAK	1%			0%	73%	25%	2%	0%	0%	0%
EMBR	5%			0%	0%	0%	0%	0%	0%	100%
MONT	2%			0%	0%	0%	0%	0%	0%	100%

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
<1 mile from HT	4%			10%	23%	63%	2%	0%	2%	0%
1-2 miles from HT	5%			20%	58%	15%	2%	0%	5%	0%
2-5 miles from HT	27%			58%	40%	0%	0%	0%	2%	0%
Richmond	1%			100%	0%	0%	0%	0%	0%	0%
Near Coliseum	8%			50%	20%	0%	0%	0%	2%	28%

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution		Percent of Distribution Lost	
	Weekend		Weekend	
HAYW	2%		20%	
SHAY	1%		30%	
UCTY	3%		40%	
FRMT	6%		50%	
WSPR	3%		60%	
CAST	2%		20%	
WDUB	3%		30%	
DUBL	8%		40%	

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Percent of Distribution Lost	
	Weekend		Weekend	
20-25 mi SE of HT	5%		10%	
25-30 mi SE of HT	5%		15%	
30-40 mi SE of HT	4%		20%	
40+ mi SE of HT	4%		25%	

Shifts Towards

New Attendees Origins	% of Attendees Gained	Weekend	Mode Split							
			Drive	TNC	Walk	Bike	Ferry	Bus	BART	
Oakland/Piedmont	50%			30%	31%	13%	1%	0%	3%	22%
Central Contra Costa	20%			50%	10%	0%	0%	0%	0%	40%
San Francisco	20%			0%	0%	0%	0%	1%	0%	99%
Alameda	10%			79%	10%	0%	0%	1%	10%	0%
Howard Terminal Devlopment	0%			0%	0%	98%	2%	0%	0%	0%

Appendix B

Project 2.0 Assumptions

Project 2.0 Assumptions - Baseball - Arrivals

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART		
12TH	3%	3%	2%		0%	23%	65%	5%	0%	7%	0%	0%	23%	65%	5%	0%	7%	0%	0%	24%	71%	5%	0%	0%	0%	
19TH	3%	4%	2%		0%	52%	25%	8%	0%	15%	0%	0%	52%	25%	8%	0%	15%	0%	0%	61%	29%	8%	0%	2%	0%	
MCAR	2%	2%	2%		0%	47%	0%	3%	0%	0%	50%	0%	47%	0%	3%	0%	0%	50%	0%	47%	0%	3%	0%	0%	50%	
ASHB	1%	1%	1%		0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	
ROCK	2%	2%	2%		0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	
LAKE	3%	3%	3%		0%	27%	68%	5%	0%	0%	0%	0%	27%	68%	5%	0%	0%	0%	0%	27%	68%	5%	0%	0%	0%	
FTVL	3%	6%	4%		0%	32%	0%	3%	0%	0%	65%	0%	32%	0%	3%	0%	0%	65%	0%	32%	0%	3%	0%	0%	65%	
WOAK	1%	1%	1%		0%	37%	55%	8%	0%	0%	0%	0%	37%	55%	8%	0%	0%	0%	0%	37%	55%	8%	0%	0%	0%	
EMBR	6%	4%	4%		0%	0%	0%	0%	30%	0%	70%	0%	0%	0%	0%	5%	0%	95%	0%	0%	0%	0%	5%	0%	95%	
MONT	5%	3%	2%		0%	0%	0%	0%	20%	0%	80%	0%	0%	0%	0%	3%	0%	97%	0%	0%	0%	0%	3%	0%	97%	

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend							
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART			
<1 mile from HT	3%	2%	1%		10%	0%	75%	8%	0%	7%	0%	10%	0%	75%	8%	0%	7%	0%	10%	0%	75%	8%	0%	7%	0%		
1-2 miles from HT	3%	3%	3%		45%	22%	15%	8%	0%	10%	0%	45%	22%	15%	8%	0%	10%	0%	45%	22%	15%	8%	0%	10%	0%		
2-5 miles from HT	26%	24%	25%		78%	16%	0%	3%	0%	3%	0%	78%	16%	0%	3%	0%	3%	0%	78%	16%	0%	3%	0%	3%	0%		
Richmond	1%	2%	2%		100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%		
Near Coliseum	9%	9%	7%		57%	5%	0%	0%	0%	2%	36%	57%	5%	0%	0%	0%	2%	36%	57%	5%	0%	0%	0%	2%	36%		

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
HAYW	2%	2%	3%	20%	20%	20%
SHAY	1%	2%	1%	30%	30%	30%
UCTY	3%	4%	3%	40%	40%	40%
FRMT	4%	4%	5%	50%	50%	50%
WSPR	3%	3%	2%	60%	60%	60%
CAST	3%	2%	4%	20%	20%	20%
WDUB	4%	5%	5%	30%	30%	30%
DUBL	10%	8%	12%	40%	40%	40%

Current Vehicle Origins	Existing Coliseum Vehicle Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
20-25 mi SE of HT	5%	5%	5%	20%	20%	10%
25-30 mi SE of HT	4%	5%	5%	30%	30%	15%
30-40 mi SE of HT	4%	4%	4%	40%	40%	20%
40+ mi SE of HT	3%	5%	5%	50%	50%	25%

Shifts Towards

New Attendees Origins	% of Attendees Gained			Mode Split - Weekday Evening								Mode Split - Weekday Day								Mode Split - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART		
Oakland/Piedmont	50%	50%	50%	30%	17%	13%	4%	0%	4%	32%	30%	17%	13%	4%	0%	4%	32%	30%	17%	13%	4%	0%	4%	32%		
Central Contra Costa	20%	20%	20%	55%	5%	0%	0%	0%	0%	40%	55%	5%	0%	0%	0%	0%	40%	55%	5%	0%	0%	0%	0%	40%		
San Francisco	20%	20%	20%	0%	0%	0%	0%	25%	0%	75%	0%	0%	0%	0%	1%	0%	99%	0%	0%	0%	0%	1%	0%	99%		
Alameda	10%	10%	10%	75%	5%	0%	0%	10%	10%	0%	84%	5%	0%	0%	1%	10%	0%	84%	5%	0%	0%	1%	10%	0%		
Howard Terminal Development	170	170	80	0%	0%	92%	8%	0%	0%	0%	0%	0%	92%	8%	0%	0%	0%	0%	0%	92%	8%	0%	0%	0%		

Yellow highlight are changes between
Project 1.0 to Project 2.0

Project 2.0 Assumptions - Baseball - Departures

Mode Shift of Current BART Attendees

Current BART Destinations	Existing Coliseum BART Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day							Mode Shift - Weekend						
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	
12TH	2%	2%	2%		0%	18%	72%	5%	0%	5%	0%	0%	23%	65%	5%	0%	7%	0%	0%	19%	71%	5%	0%	5%	0%
19TH	2%	4%	2%		0%	65%	27%	8%	0%	0%	0%	0%	52%	25%	8%	0%	15%	0%	0%	63%	29%	8%	0%	0%	0%
MCAR	3%	2%	2%		0%	47%	0%	3%	0%	0%	50%	0%	47%	0%	3%	0%	0%	50%	0%	47%	0%	3%	0%	0%	50%
ASHB	2%	2%	1%		0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%
ROCK	2%	2%	2%		0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%	0%	27%	0%	3%	0%	0%	70%
LAKE	4%	4%	4%		0%	27%	68%	5%	0%	0%	0%	0%	27%	68%	5%	0%	0%	0%	0%	27%	68%	5%	0%	0%	0%
FTVL	4%	7%	6%		0%	32%	0%	3%	0%	0%	65%	0%	32%	0%	3%	0%	0%	65%	0%	32%	0%	3%	0%	0%	65%
WOAK	1%	1%	1%		0%	37%	55%	8%	0%	0%	0%	0%	37%	55%	8%	0%	0%	0%	0%	37%	55%	8%	0%	0%	0%
EMBR	4%	5%	4%		0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	30%	0%	70%	0%	0%	0%	0%	20%	0%	80%
MONT	3%	2%	2%		0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	20%	0%	80%	0%	0%	0%	0%	15%	0%	85%

Mode Shift of Current Vehicles

Current Vehicle Destinations	Existing Coliseum Vehicle Distribution			Mode Shift - Weekday Evening								Mode Shift - Weekday Day								Mode Shift - Weekend							
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART			
<1 mile from HT	1%	2%	2%		10%	0%	78%	8%	0%	4%	0%	10%	0%	75%	8%	0%	7%	0%	10%	0%	78%	8%	0%	4%	0%		
1-2 miles from HT	2%	5%	2%		45%	22%		15%	8%	0%	10%	0%	45%	22%	15%	8%	0%	10%	0%	45%	22%	15%	8%	0%	10%	0%	
2-5 miles from HT	24%	24%	23%		78%	16%		0%	3%	0%	3%	0%	78%	16%	0%	3%	0%	3%	0%	78%	16%	0%	3%	0%	3%	0%	
Richmond	2%	3%	1%		100%	0%		0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	
Near Coliseum	8%	9%	8%		56%	5%		0%	0%	0%	3%	36%	56%	5%	0%	0%	0%	3%	36%	57%	5%	0%	0%	0%	2%	36%	

Geographic Shift of Current Attendees

Shifts Away

Current BART Destinations	Existing Coliseum BART Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
HAYW	3%	2%	3%	20%	20%	20%
SHAY	2%	2%	2%	30%	30%	30%
UCTY	3%	5%	3%	40%	40%	40%
FRMT	4%	5%	5%	50%	50%	50%
WSPR	4%	2%	2%	60%	60%	60%
CAST	3%	2%	5%	20%	20%	20%
WDUB	4%	5%	5%	30%	30%	30%
DUBL	11%	7%	12%	40%	40%	40%

Current Vehicle Destinations	Existing Coliseum Vehicle Distribution			Percent of Distribution Lost		
	Weekday Evening	Weekday Day	Weekend	Weekday Evening	Weekday Day	Weekend
20-25 mi SE of HT	5%	3%	5%	20%	20%	10%
25-30 mi SE of HT	4%	6%	5%	30%	30%	15%
30-40 mi SE of HT	4%	3%	4%	40%	40%	20%
40+ mi SE of HT	5%	4%	6%	50%	50%	25%

Shifts Towards

New Attendees Destinations	% of Attendees Gained			Mode Split - Weekday Evening								Mode Split - Weekday Day								Mode Split - Weekend							
	Weekday Evening	Weekday Day	Weekend	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART	Drive	TNC	Walk	Bike	Ferry	Bus	BART			
Oakland/Piedmont	50%	50%	50%	50%	30%	17%	13%	4%	0%	4%	32%	30%	17%	13%	4%	0%	4%	32%	30%	17%	13%	4%	0%	4%	32%		
Central Contra Costa	20%	20%	20%		55%	5%	0%	0%	0%	0%	40%	55%	5%	0%	0%	0%	0%	40%	55%	5%	0%	0%	0%	0%	40%		
San Francisco	20%	20%	20%		0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	1%	0%	99%	0%	0%	0%	0%	1%	0%	99%			
Alameda	10%	10%	10%		85%	5%	0%	0%	0%	10%	0%	84%	5%	0%	0%	1%	10%	0%	84%	5%	0%	0%	1%	10%	0%		
Howard Terminal Development	170	170	80		0%	0%	92%	8%	0%	0%	0%	0%	0%	92%	8%	0%	0%	0%	0%	0%	92%	8%	0%	0%	0%		

Yellow highlight are changes between
Project 1.0 to Project 2.0

Project 2.0 Assumptions - Concerts - Arrivals

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
12TH	2%		0%	0%	24%	71%	5%	0%	0%	0%
19TH	3%		0%	0%	61%	29%	8%	0%	2%	0%
MCAR	2%		0%	0%	47%	0%	3%	0%	0%	50%
ASHB	1%		0%	0%	27%	0%	3%	0%	0%	70%
ROCK	2%		0%	0%	27%	0%	3%	0%	0%	70%
LAKE	3%		0%	0%	27%	68%	5%	0%	0%	0%
FTVL	4%		0%	0%	32%	0%	3%	0%	0%	65%
WOAK	1%		0%	0%	37%	55%	8%	0%	0%	0%
EMBR	5%		0%	0%	0%	0%	0%	30%	0%	70%
MONT	2%		0%	0%	0%	0%	0%	20%	0%	80%

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
<1 mile from HT	4%		10%	0%	0%	75%	8%	0%	7%	0%
1-2 miles from HT	5%		45%	22%	0%	15%	8%	0%	10%	0%
2-5 miles from HT	27%		78%	16%	0%	0%	3%	0%	3%	0%
Richmond	2%		100%	0%	0%	0%	0%	0%	0%	0%
Near Coliseum	7%		57%	5%	0%	0%	0%	0%	2%	36%

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution	Percent of Distribution Lost
	Weekend	Weekend
HAYW	2%	20%
SHAY	1%	30%
UCTY	3%	40%
FRMT	6%	50%
WSPR	3%	60%
CAST	2%	20%
WDUB	3%	30%
DUBL	8%	40%

Current Vehicle Origins	Existing Coliseum Vehicle Distribution	Percent of Distribution Lost
	Weekend	Weekend
20-25 mi SE of HT	5%	10%
25-30 mi SE of HT	5%	15%
30-40 mi SE of HT	4%	20%
40+ mi SE of HT	4%	25%

Shifts Towards

New Attendees Origins	% of Attendees Gained	Mode Split							
		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
Oakland/Piedmont	50%	30%	17%	0%	13%	4%	0%	4%	32%
Central Contra Costa	20%	55%	5%	0%	0%	0%	0%	0%	40%
San Francisco	20%	0%	0%	0%	0%	0%	1%	0%	99%
Alameda	10%	84%	5%	0%	0%	0%	1%	10%	0%
Howard Terminal Devlopment	80%	0%	0%	92%	8%	0%	0%	0%	0%

Yellow highlight are changes between
Project 1.0 to Project 2.0

Project 2.0 Assumptions - Concerts - Departure

Mode Shift of Current BART Attendees

Current BART Origins	Existing Coliseum BART Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
12TH	2%			0%	19%	71%	5%	0%	5%	0%
19TH	3%			0%	63%	29%	8%	0%	0%	0%
MCAR	2%			0%	47%	0%	3%	0%	0%	50%
ASHB	1%			0%	27%	0%	3%	0%	0%	70%
ROCK	2%			0%	27%	0%	3%	0%	0%	70%
LAKE	3%			0%	27%	68%	5%	0%	0%	0%
FTVL	4%			0%	32%	0%	3%	0%	0%	65%
WOAK	1%			0%	37%	55%	8%	0%	0%	0%
EMBR	5%			0%	0%	0%	0%	0%	0%	100%
MONT	2%			0%	0%	0%	0%	0%	0%	100%

Mode Shift of Current Vehicles

Current Vehicle Origins	Existing Coliseum Vehicle Distribution		Mode Shift							
	Weekend		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
<1 mile from HT	4%			10%	0%	78%	8%	0%	4%	0%
1-2 miles from HT	5%			45%	22%	15%	8%	0%	10%	0%
2-5 miles from HT	27%			78%	16%	0%	3%	0%	3%	0%
Richmond	1%			100%	0%	0%	0%	0%	0%	0%
Near Coliseum	8%			57%	5%	0%	0%	0%	2%	36%

Geographic Shift of Current Attendees

Shifts Away

Current BART Origins	Existing Coliseum BART Distribution	Percent of Distribution Lost
	Weekend	Weekend
HAYW	2%	20%
SHAY	1%	30%
UCTY	3%	40%
FRMT	6%	50%
WSPR	3%	60%
CAST	2%	20%
WDUB	3%	30%
DUBL	8%	40%

Current Vehicle Origins	Existing Coliseum Vehicle Distribution	Percent of Distribution Lost
	Weekend	Weekend
20-25 mi SE of HT	5%	10%
25-30 mi SE of HT	5%	15%
30-40 mi SE of HT	4%	20%
40+ mi SE of HT	4%	25%

Shifts Towards

New Attendees Origins	% of Attendees Gained	Mode Split							
		Drive	TNC	Walk	Bike	Ferry	Bus	BART	
Oakland/Piedmont	50%	30%	17%		13%	4%	0%	4%	32%
Central Contra Costa	20%	55%	5%		0%	0%	0%	0%	40%
San Francisco	20%	0%	0%		0%	0%	1%	0%	99%
Alameda	10%	84%	5%		0%	0%	1%	10%	0%
Howard Terminal Devlopment	80	0%	0%		92%	8%	0%	0%	0%

Yellow highlight are changes between
Project 1.0 to Project 2.0